THE

CHRISTIAN PHILOSOPHY

QUARTERLY

OCTOBER 1881

1. HISTORICAL.

2. THE CRY OF "CONFLICT,"

CHARLES F. DEEMS, D.D., LL.D., New York

3. WHAT WE MEAN BY CHRISTIAN PHILOSOPHY,

NOAH PORTER, D.D., LL.D., President Yale College

4. SOME DIFFICULTIES IN MODERN MATERIALISM,

BORDEN P. BOWNE, Prof. Boston University

5. THE RELIGIOUS ASPECT OF THE AMERICAN SCIENTIFIC ASSOCIATION,

Prof. H. S. TROWBRIDGE, Glasgow, Mo.

NEW YORK

PUBLISHED FOR THE AMERICAN INSTITUTE OF CHRISTIAN PHILOSOPHY

ANSON D. F RANDOLPH & COMPANY

900 BROADWAY, COR TWENTIETH ST.

TWO DOLLARS A YEAR FIFTY CENTS A COPY

XUM

AMERICAN INSTITUTE OF CHRISTIAN PHILOSOPHY

TRUSTEES:

CHARLES F. DEEMS. HOWARD CROSBY. A. H. BRADFORD.
CORNELIUS VANDERBILT. WM. O. McDOWELL.

OBJECTS.

This society has been founded for the purpose of promoting the following objects of high importance to both religion and science :—

First.—To investigate fully and impartially the most important questions of philosophy and science, but more especially those that bear upon the great truths revealed in Holy Scripture, with the view of demonstrating the harmony between true Christianity and true Science.

Second.—To associate MEN OF SCIENCE AND AUTHORS, who have already been engaged in such investigations, and all others who may be interested in them, in order to strengthen their efforts by association, and by bringing together the results of such labors, after full discussion, in the printed transactions of an institution, to give greater force and influence to proofs and arguments which might be little known, or even disregarded, if put forward merely by individuals.

Third.—To consider the mutual bearings of the various scientific conclusions arrived at in the several distinct branches into which science is now divided, in order to get rid of contradictions and conflicting hypotheses, and thus promote the real advancement of true science ; and to examine and discuss all supposed scientific results with reference to final causes, and the more comprehensive and fundamental principles of philosophy proper, based upon faith in the existence of one eternal God, the creator of all things.

Fourth.—To publish papers read before the society in furtherance of the above objects, along with full reports of the discussions thereon, in the form of a journal, or as the transactions of the Institute, or in a quarterly review of Christian science.

Fifth.—When subjects have been fully discussed, to make the results known by means of lectures of a more popular kind, and to publish such lectures.

Sixth.—To publish English translations of important foreign works of real scientific and philosophical value, especially those bearing upon the relation between the Scriptures and Science; and to co-operate with other philosophical societies at home and abroad, which are now, or may hereafter be formed, in the interest of Scriptural truth and of real science, and, generally, in furtherance of the objects of this Society.

Seventh.—To found a library and reading-room for the use of the members of the Institute, combining the principal advantages of a literary club.

MEMBERSHIP AND SUBSCRIPTION.

The annual subscription for members is ten dollars ; the annual subscription for associates is five dollars. One hundred dollars will constitute a life-member, and fifty dollars a life-associate.

Members are entitled to a free copy, by mail, of each number of the official publication which contains the papers read before the Institute ; also to a free ticket to every course of lectures delivered under the auspices of the Institute ; also to a free use of the Institute's library.

As yet, there are no rents and no salaries. The expenses are for stationery, postage, clerk hire and printing. The moneys accumulated from fees, donations, etc., are spent for lectures, and the publication and distribution of lectures on the Relations of Science and Religion.

Persons who are not members of the Institute are respectfully invited to forward any Papers they may desire to be read before the Institute, either by the author or by proxy. If accepted and read they will be published as the funds shall justify.

The Monthly Meeting is on the last Thursday of each month, in the Institute's Rooms, at 7.30 p.m., unless otherwise ordered.

The rooms of the Institute are at 4 Winthrop Place, Greene Street near Eighth, New York, and are open every day, except Sunday, from 3 to 5 p.m. Visitors are invited.

Donations to the library are respectfully solicited.

Forms of application for membership will be forwarded to any address upon application.

XUM

HISTORICAL.

THE Victoria Institute is an organization which has for its object the creation and distribution of literature illustrating the relations between science and religion. Many of its members are in Canada and the United States, and many of its ablest papers are produced on this side the Atlantic. It was very natural that in the course of time it should occur to American Christians and scholars that it would be well to attempt the formation of a similar institution in this country.

Whether there would be found enough interest to give this movement such a beginning as would attract the attention of those who should be interested in such an undertaking, and who could give it the aid necessary to make it practically useful, could not be determined until some one risked a commencement. The Rev. Dr. Deems, the pastor of the Church of the Strangers in New York, who had for years been a member of the British Institute, and the Rev. Amory H. Bradford, pastor of the Congregational Church in Montclair, made an effort to ascertain whether there could be found ten gentlemen who would deliver a course of lectures all in the line of the relations of science to religion. They had the pleasure of discovering not only that the scheme was practicable, but that many gentlemen distinguished for their learning, and held in high repute throughout the country on account of their exalted character, were in sympathy with the movement, although they could not take part in the first course. A syllabus having been made, a hearty coadjutor was found in William O. McDowell, Esq., who owned a beautiful property called Warwick Woodlands, situated on the west side of Greenwood Lake, a beautiful body of water lying nearly equally in New Jersey and New York, at the terminus of a rail-

way forty-two miles in length from New York City. This gentleman engaged to build a Hall which should be used for the Lectures, and by his energy secured an Encampment Hotel, the rooms of which consisted of tents. He showed the additional munificence of paying the fees and expenses of the lecturers. According to announcement the course was opened on the morning of July 12, with the reading of a portion of the Holy Scriptures and with prayer by Charles F. Deems, D.D., LL.D., who had permitted himself to be announced as Dean of the School, and who presided over all its exercises. Dr. Deems then delivered a lecture on *The Cry of "Conflict."* On Wednesday, 13th July, the opening worship was conducted by Rev. W. B. Palmore, of Mo., and a lecture delivered by President Porter of Yale College: the subject, *What we mean by Christian Philosophy.* On Thursday, 14th July, the opening worship was conducted by Rev. George A. Gates, of Montclair, and a lecture delivered by Prof. Borden P. Bowne, of Boston University: the subject, *Some Difficulties of Modern Materialism.* On Friday, 15th July, the opening worship was led by Rev. Prof. Sawyer. The Rev. Thomas Guard, of Baltimore, had been announced, but the state of the health of that gentleman kept him from the School, and his place was supplied by Prof. Stephen Alexander, of Princeton, whose lecture was on the *Origin and Primitive State of Man.* On Saturday, 16th July, the public worship was conducted by Rev. Addison K. Strong, D.D., of Hoboken, and the lecture delivered by Prof. C. A. Young, of Princeton, on *Astronomical Facts for Philosophical Thinkers.* A number of persons remained in the Encampment Hotel, and many visitors were at the other hotels around the lake, drawn thither by the great beauty of Lake Greenwood and its vicinity. The published syllabus provided a sermon for Sunday, and no discourse collected a larger congregation than that which attended the sermon, which was delivered by the Rev. Amory H. Bradford, A.M., of Montclair, N. J., who had acted as Secretary of the Summer School from its inception. Mr. Bradford's subject was *Conditions of Spiritual Sight.* The text was Matt. v. 8: "Blessed are the pure in heart, for they shall see God." Monday, 18th July, the public worship was conducted by Rev. W. C. Stiles, of Brooklyn, and the lec-

ture delivered by Prof. Alexander Winchell, of the University of Michigan: the subject, *The Philosophical Consequences of Evolution.* Tuesday, 19th July, the public worship was conducted by Rev. Dr. Taylor, of Newark, N. J., and the lecture delivered by the Rev. Lyman Abbott, D.D., of New York City: the subject, *Foundations of Christian Belief.* Wednesday, 20th July, the public worship was conducted by Rev. Dr. E. O. Flagg, of Newark, N. J., and the lecture delivered by the Rev. J. H. McIlvaine, D.D., of Newark, N. J.: the subject, *Science and Revelation.* Thursday, 21st July, the public worship was conducted by the Rev. Dr. Bacon, of Toledo, O., and the lecture delivered by Prof. B. N. Martin, of the University of New York: the subject, *Recent Physical Theories, in their Bearing on Teleology.* Friday, 22d July, the public worship was conducted by the Rev. Dr. Craven, of Newark, N. J., and the lecture delivered by President John Bascom, of the University of Wisconsin: the subject, *The Gains and Losses of Faith from Science.*

From the beginning to the close of the course of lectures there was an increase of attendance and interest.

On the 21st of July, 1881, in the Hall of Philosophy at Warwick Woodlands, Greenwood Lake, N. Y., a meeting was held on call for the purpose of organizing the American Institute of Christian Philosophy. The Rev. J. H. McIlvaine, D.D., of Newark, N. J., presided, and Rev. A. H. Bradford, of Montclair, N. J., was elected Secretary. The following paper was adopted and published as the prospectus of the American Institute of Christian Philosophy.

OBJECTS.

This Society has been founded for the purpose of promoting the following Objects of high importance to both Religion and Science:

First. To investigate fully and impartially the most important questions of Philosophy and Science, but more especially those that bear upon the great truths revealed in Holy Scripture, with the view of demonstrating the harmony between true Christianity and true Science.

Second. To associate MEN OF SCIENCE and AUTHORS who have already been engaged in such investigations, and all others who may be interested in them, in order to strengthen their efforts by association, and by bringing together the results of such labors, after full discussion, in the printed

Transactions of an Institution; to give greater force and influence to proofs and arguments which might be little known, or even disregarded, if put forward merely by individuals.

Third. To consider the mutual bearings of the various scientific conclusions arrived at in the several distinct branches into which science is now divided, in order to get rid of contradictions and conflicting hypotheses, and thus promote the real advancement of true Science; and to examine and discuss all supposed scientific results with reference to final causes, and the more comprehensive and fundamental principles of Philosophy proper, based upon faith in the existence of one Eternal God, the Creator of all things.

Fourth. To publish Papers read before the Society in furtherance of the above objects, along with full reports of the discussions thereon, in the form of a Journal, or as the Transactions of the Institute, or in a Quarterly Review of Christian Science.

Fifth. When subjects have been fully discussed, to make the results known by means of Lectures of a more popular kind, and to publish such Lectures.

Sixth. To publish English translations of important foreign works of real scientific and philosophical value, especially those bearing upon the relation between the Scriptures and Science; and to co-operate with other philosophical societies at home and abroad, which are now or may hereafter be formed, in the interest of Scriptural truth and of real Science, and generally in furtherance of the objects of this Society.

Seventh. To found a Library and Reading Room for the use of the Members of the Institute, combining the principal advantages of a Literary Club.

MEMBERSHIP AND SUBSCRIPTION.

The Annual Subscription for MEMBERS is Ten Dollars. The Annual Subscription for Associates is Five Dollars. One Hundred Dollars will constitute a Life Member, and Fifty Dollars a Life Associate.

Members are entitled to a free copy, by mail, of each number of the Official Publication which contains the papers read before the Institute; also to a free ticket to every course of Lectures delivered under the auspices of the Institute; also to a free use of the Institute's Library.

Rev. Charles F. Deems, D.D., LL.D., was elected Provisional President; Rev. Amory H. Bradford, Provisional Secretary; William O. McDowell, Provisional Treasurer; and those gentlemen were empowered to do all that may be necessary, in their judgment, to promote the objects of the Institute until the Institute should be incorporated and by-laws should be adopted.

The first monthly meeting was held at Warwick Woodlands,

on the 28th of August. It was then ordered that all sums coming to the Institute by legacy or gift be invested by the officers as a permanent endowment fund, unless otherwise directed by the devisers or donors. The following gentlemen were elected Vice-Presidents, viz.: John Bascom, LL.D., of Wisconsin; Hon. Kemp P. Battle, LL.D., of North Carolina; Rev. Bishop Charles Edward Cheney, of Illinois; and Gen. G. W. Custis Lee, of Virginia. It was ordered that the annual membership run for one year following the first of the month next after the date of the payment of the fee. The officers of the Church of the Strangers having offered to the Institute the free use of their parlors for the office and the meetings of the Institute, the generous offer was accepted, and it was ordered that the monthly meeting of the Institute shall be held in those parlors (4 Winthrop Place, Greene Street, near Waverley Place, New York) on the last Thursday of every month, at 7.30 P.M., unless otherwise ordered.

The second monthly meeting was held on the 29th of September, 1881, in the rooms of the Institute, 4 Winthrop Place, New York, the Rev. Dr. Deems presiding. Rev. Edward M. Deems, pastor of the Westminster Church, N. Y., conducted the religious services. A form of certificate of membership was adopted, and a committee was appointed to report to the next monthly meeting a system of by-laws.

The third monthly meeting, being the first quarterly meeting, was held in the rooms of the Institute, the President presiding. A portion of the Holy Scripture was read and prayer was offered by Marshall B. Smith, D.D., of Passaic, N. J. The Committee on By-Laws reported the following paper, which was unanimously adopted:

By-Laws of the American Institute of Christian Philosophy.

ARTICLE I.

NAME.

This Society shall be known as The American Institute of Christian Philosophy, and its Constitution shall be the act of incorporation, together with the prospectus setting forth objects, etc., adopted July 21, 1881.

XUM

ARTICLE II.

MEETINGS.

SEC. 1. The Institute shall hold regular monthly meetings on the last Thursday evening of every month, at 7.30 o'clock, except when otherwise ordered.

SEC. 2. The President shall preside at all the meetings, or in his absence, or at his call, some Vice-President; and in the absence of President and Vice-Presidents, the members of the Institute shall select from among themselves a President *pro tempore*.

SEC. 3. The following shall be the order of proceeding at the monthly meeting:

1. Reading Holy Scripture and Prayer.
2. Reading the Minutes of the latest preceding Meeting.
3. Election of Members.
4. Election of Officers, if any vacancies exist.
5. Report of the Standing Committees.
6. Report of the Special Committees.
7. New Business.
8. Announcements.
9. Reading of the Paper appointed for the Evening.

SEC. 4. Upon the arrival of the hour appointed for any paper which has been announced, its reading shall take place, and the unfinished items of business shall follow the reading.

ARTICLE III.

OFFICERS.

SEC. 1. The Officers shall be a President, a Vice-President for every State in which there are members, a Secretary, and a Treasurer.

SEC. 2. The Officers shall be elected by the members from among the members.

SEC. 3. The election of Officers shall be by ballot, and shall take place annually at a time to be hereafter fixed by the Institute.

SEC. 4. Gentlemen not residents of the United States may be chosen Honorary Vice-Presidents by the Institute.

ARTICLE IV.

DUTIES OF OFFICERS.

The duties of the Officers shall be such as ordinarily pertain to the offices of President, Vice-President, Secretary, and Treasurer. The Treasurer shall render a statement at each monthly meeting of the sum of the

amounts received and the sum of the amounts expended. He shall also present a written report quarterly at the meetings held in March, June, September, and December of each year, giving the items of expenditure. The reports of the Treasurer shall be audited by the Committee on Finance.

ARTICLE V.

STANDING COMMITTEES.

SEC. 1. There shall be five Standing Committees, viz.: on Membership, on Finance, on Papers, on Lecturers, and on Publication.

Each Committee shall consist of five members, to be appointed by the President from among the members and associate members.

SEC. 2. *Committee on Membership.*—It shall be the duty of this Committee to secure members for the Institute, and to examine and report upon any questions which may arise touching membership.

SEC. 3. *Finance Committee.*—The duty of the Committee on Finance shall be to devise ways and means to carry out the objects of the Institute, and to make the permanent investments ordered by the Institute.

SEC. 4. *Committee on Papers.*—It shall be the duty of the Committee on Papers to secure articles to be read at the monthly meetings of the Institute, and to determine upon the fitness of such as shall be voluntarily offered, and to pass to the Committee on Publication all papers that have been read before the Institute.

SEC. 5. *Committee on Lecturers.*—It shall be the duty of this Committee to procure gentlemen to deliver lectures at the quarterly meetings and in any courses that may be determined upon by the Institute.

SEC. 6. *Committee on Publication.*—It shall be the duty of this Committee to examine the papers and lectures and report to the Institute such as they think should be published, and to supervise the publication of papers ordered by the Institute.

ARTICLE VI.

CHANGES IN THE BY-LAWS.

Any one of these By-Laws may be rescinded or amended by a vote of two thirds of the members of the Institute assembled under notice to act upon the proposed change.

A paper was then read by Edward C. Mann, M.D., of New York, on *Errors of Materialistic Physiology*. It was discussed by Rev. Wesley R. Davis, Marshall B. Smith, D.D., Gen. O. O. Howard, Rev. A. H. Bradford, and the President, and was ordered to the Committee on Publication.

The following gentlemen, who had become members of the

XUM

Institute, were elected Vice-Presidents, namely: James McCosh, D.D., LL.D., for New Jersey, and the Rev. Bishop McTyeire, for Tennessee.

It was determined to issue a quarterly publication to be the organ of the Institute; and Rev. Dr. Deems, Gen. O. O. Howard, and Charles M. Davis, Esq., were appointed to bring out the first number, in which it was directed that the publication of the lectures before the Summer School of Philosophy be begun.

THE CRY OF "CONFLICT."

[A Lecture delivered before the Summer School of Christian Philosophy, 12th July, 1881.]

BY CHARLES F. DEEMS, D.D., LL.D.,
Pastor of the Church of the Strangers, New York.

THE symbol of faith repeated throughout Christendom probably by more people than any other, and repeated oftener, is what is commonly known as "The Apostles' Creed." It opens with this solemn assertion: "I believe in God the Father Almighty, Maker of heaven and of earth." It is a declaration of the intimacy of religion and science. All true religion is based on the faith which a man has in the existence of God and prompts him to conform his whole outer and inner life to the relationship which exists between himself and God as the Father of the spirits of all flesh. All science deals with facts; that is, with things that are *made*. No man, then, who intelligently and heartily believes the first sentence of the Apostles' Creed can for a moment yield to the suggestion that there is anything in religion to discourage the most earnest pursuit of the knowledge of facts and their laws. Nor can any man who has the true scientific spirit ever study facts and the laws by which facts exhibit themselves in phenomena, for the purpose of denying the existence of the Author of facts, or for the purpose of bringing disloyalty into the hearts of any of His children. Moreover, it should be apparent to any candid mind that the belief that He who is the man's Almighty Father is the Maker of all things of which he has cognizance by the senses, must stimulate that student in his researches into nature. The history of science confirms

XUM

this. The men who have laid the foundations and built up the structure of science in modern times have never been atheists, but have all been believers in God the Father Almighty.

Those of us who have been engaged in projecting and fostering this course of lectures have perceived that there are uninstructed persons, many of them among the young, who are deceived by an artful device of men who hate religion—the device of making them believe that there is antagonism of religion to science or of science to religion—assuming all the while that, there being such conflict, science is always right and religion therefore always wrong; and, moreover, that science consists of their crude guesses, their illogical inferences from their insufficient observations of phenomena.

The cry of the "Conflict of Religion and Science" is recent and fallacious. It is mischievous to the interests of both science and religion; and would be most mournful if we did not believe that, in the very nature of things, it must be ephemeral. Its genesis is to be traced to the weakness of some professors of religion, and to the wickedness of a few shallow professors of science. No man of powerful and healthy mind, who is devout, ever has the slightest apprehension that any advancement of science can shake the foundations of that faith which is necessary to salvation. No man of powerful and healthy mind, engaged in observing, recording, and classifying facts, and in searching among them for those identities and differences which point to principles and indicate laws, ever feels that he suffers any embarrassment or limitations in his studies by the most reverent love he can have for God as his Father, or the most tender sympathy he can have for man as his brother, or that hatred for sin which produces penitence, or that constant leaning of his heart on God which produces spiritual-mindedness, or that hope of a state of immortal holiness which has been the ideal of humanity in all ages.

All this dust about "the confiict" has been flung up by men of insufficient faith, who doubted the basis of their faith; or by men of insufficient science, who have mistaken theology or "the Church" for religion; or by unreasonable and wicked

men, who have sought to pervert the teachings of science so as to silence the voice of conscience in themselves, or put God out of their thoughts, so that a sense of His eternal recognition of the eternal difference between right and wrong might not overawe their spirits in the indulgence of the lust of the flesh, the lust of the eye, and the pride of life. It may be profitable to discriminate these; and if badges and flags have become mixed in this fray, it may be well to readjust our ensigns, so that foes shall strike at only foes.

It is, first of all, necessary to settle distinctly what science is, as well as what it is not; and, also, what religion is, as well as what it is not.

We can all afford to agree upon the definition rendered by the only man who has been found in twenty-two centuries to add anything important to the imperial science of logic. Sir William Hamilton defines science as "a complement of cognitions, having in point of form the character of logical perfection, and in point of matter the character of real truth." Under the focal heat of a definition like this, much that claims to be science will be consumed. It is the fashion to intimate, if not to assert, that it is much more easy to become scientific than to become religious; that in one case a man is dealing with the real, in the other with the ideal; in the one case with the comprehensible, in the other with the incomprehensible; in the one case with that which is certain and exact, and in the other case with that which at best is only probable and indefinite.

There can be no doubt, among thoughtful men, of the great value of both science and religion. A thinker who is worth listening to is always misunderstood if it be supposed that he means to disparage either. An attempt to determine the limits of religion is no disparagement thereof, because all the most religious men who are accustomed to think are engaged in striving to settle those limits, in order that they may have advantage of the whole territory of religion on the one hand, and on the other may not take that as belonging to religion which belongs to something else.

Now, if Sir William Hamilton's definition is to be taken, we shall perceive that he represents science in its quality, in its

XUM

quantity, and in its form. Cognition of something is necessary for science. Then (1) the knowledge of things known must be true; (2) that knowledge must be full, and (3) it must be accurate; it must be in such form as to be most readily and successfully used by the logical understanding for purposes of thought.

This sets aside very much that has been called science, and, as it seems, perhaps nearly all that which has been the material used by those who have raised the most smoke over this "conflict" question.

"Guesses at truth" are valuable only as the pecking at a plastered wall, to find where a wooden beam runs, is useful; but a guess is not knowledge. A working hypothesis would not be to be despised, although the student of science might feel quite sure in advance that when he had learned the truth in this department he would throw the hypothesis away. A working hypothesis, like a scaffold, is useful: but a scaffold is not a wall. Art is not science. Art deals with the appearances, science with the realities, of things. Art deals with the external, science with the internal, of a thing; art with the phenomenon, science with the *noumenon*. It must be the "*real* truth" which we know, and know truly.

Weak men on both sides have done much harm—the weak religionists by assuming, and the weak scientists by claiming, for guesses and hypotheses the high character and full value of real truth. The guesses of both have collided in the air, and a real battle seemed impending; but it was only "guesses" which exploded—bubbles, not bombs; and it is never to be forgotten that a professor of religion has just as much right to guess as a professor of science, and the latter no more right nor skill than the former, although he has had more practice.

No man can abandon a real truth without degradation to his intellectual and moral nature; but Galileo, Kepler, and Newton, in their studies from time to time, employed and discarded theory after theory, until they reached that which was capable of demonstration. It was that, and that only, which took its place as science. In the case of Kepler, it is known what great labor he spent in attempting to represent the orbit of Mars by combinations of uniform circular motion. His

working hypothesis was the old doctrine of epicyclic curves. But his great labor was not fruitless, as has been carelessly asserted. The theory was false, and therefore not a part of real science; but, working on it, he discovered that the orbit of Mars is an ellipse, and this led him to the first of his three great laws of planetary motion, and enabled him almost immediately to discover the second. Here was a great intellect employing as a working hypothesis a theory which has always been false, and now is demonstrably false. It was not science.

Now if, while scientific men are employing working hypotheses merely as such, men representing religion fly at them as if they were holding those hypotheses as science, or if men representing science do set forth these hypotheses as if they were real knowledge of truth, and proceed to defend them as such, then much harm is done in all directions.

In the first instance, the religious man shows an impatience which is irreligious. "He that believeth doth not make haste." It is unfair to criticise any man while he is doing. Let him do what he will do; then criticise *the deed.* The artist has laid one pigment on his palette, and he is criticised before it is known what others he intends to mix with it, to procure what shade, to produce what effect. Wait until all the paint is on the canvas, and the artist has washed his brushes and drawn the curtain from his picture; then criticise *the picture.*

This impatient and weak criticism on the part of religious men is injurious to scientific progress, as well as to the progress of religion. For the latter it makes the reputation of unfairness; for the former it does one of two bad things: it obstructs free discussion among students of science, or pushes them into a foolish defiance of religion. Men must co-work with those of their own sphere of intellectual labors. They must publish guesses, conjectures, hypotheses, theories. Whatever comes into any mind must be examined by many minds. It may be true, it may be false; there must be no prejudgment. Now if, because our scientific men are discussing a new view, our religious men fly among them and disturb them by crying "heresy," "infidelity," "atheism," those students must take time to repel the charges, and thus their work be hurt. If let

XUM

alone, they may soon abandon their false theory. Certainly, if a proposition in science be false, the students of science are the men likeliest to detect the falsehood, however unlikely they may be to discover the truth that is in religion. Nothing more quickly destroys an error than to attempt to establish it scientifically.

The premature cries of the religious against the scientific have also the effect of keeping a scientific error longer alive. Through sheer obstinacy, the assailed will often hold a bad position, which, if not attacked, had been long ago abandoned. And we must have noticed that nature seems quite as able to make scientific men obstinate as grace to do this same work for the saints!

No man should be charged with being an atheist who does not, in distinct terms, announce himself to be such; and in that case the world will believe him to be so pitiful a person as to be compassionated, not assailed with hard words. But as you may drive a man away from you by representing him as your enemy, so a man inclined to science may be driven from the Christian faith if convinced that the Christian faith stands in the way of free investigation and free discussion; or he may hold on to the faith because he has brains enough to see that one may become most highly scientific and most humbly devout at the same time; but by persecution he may be compelled to withdraw from open communion with "those who profess and call themselves Christians." Then both parties lose —what neither can well afford to lose—the respect and help which each could give the other. When the son of a religious teacher turns to the works of a man whom he has heard that father denounce, and finds in any one page of those books more high religious thought than in a hundred of his father's commonplace discourses, a sad state of feeling is produced, and many mistakes are likely to follow.

Sir William Hamilton's definition of science has for *genus* "a complement of cognitions," and for *differentia* "logical perfection of form" and "real truth of matter." The definition is a demand for a certain fulness. We can only conjecture, in the case of any particular science, how much knowledge such a man as Sir William Hamilton would regard as a "complement."

But students of science do well to remind themselves that it is impossible to exceed, and very difficult to succeed, and the easiest thing imaginable to fall short. In other words, we have never been able to collect more material of knowledge than the plan of any temple of science could *work in*, and really did not demand for the completion of the structure, and that very few temples of science have been finished, even in the outline; while all the plain of thought is covered with ruins of buildings begun by thinkers, but unfinished for want of more knowledge. Even where there has been gathered a sufficient amount of knowledge to be wrought by the logical understanding into the form of a science, so that such a mind as Hamilton's would admit it as a science—*i.e.*, a sufficient complement of cognitions of truths put in logical form—another age of labor, in other departments, would so shrink this science that, in order to hold its rank, it would have to *work in* the matter of more knowledge; and, to preserve its symmetry, be compelled to readjust its architectural outlines. In other words, what is science to one age may not be science to its successor, because that successor may perceive that, although its matter had the character of real truth, and its form the character of logical perfection, *as far as it went*, nevertheless there were not enough cognitions; not enough, just because in the later age it was possible to obtain additional cognitions, which could not have been obtained earlier.

And, in point of fact, has not this been the history of each of the acknowledged sciences? And can any significance be assigned to Sir William Hamilton's definition without taking the word "complement" to mean *all the cognitions possible at the time?* Now, unless at one time men have more cognitions of any subject than at another time, one of two things must be true: either (1) no new phenomena will appear in that department, or (2) no abler observer will arise. But the history of the human mind in the past renders both suppositions highly improbable. If no new phenomena appear we shall have observers abler than have existed, because, although it were granted that no fresh accessions of intellectual power came to the race, each new generation of observers would have increased ability, because each would have the aid of the instruments and

XUM

methods of all predecessors. When we go back to consider the immense labor performed by Kepler in his investigations which led to his brilliant discoveries, we feel that if his nerves had given way under his labors, his domestic troubles, and his financial cares, or his industy had been just a little less tenacious, he would have failed in the prodigious calculations which led him to his brilliant discoveries, and gave science such a great propulsion. Just five years after the publication of Kepler's "New Astronomy" the Laird of Merchiston published, in Scotland, his "Mirifici Logarithmorum Canonis Descriptio." If Kepler had only had Napier's logarithms! But succeeding students have enjoyed this wonderful instrumental aid, and done great mental work with less draught on their vital energies.

The very facts, then, which make us proud of modern science should make scientific men very humble. It will be noticed that the most arrogant cultivators of science are those who are most ready to assail such religious men as are rigid, and hold that nothing can be added to or taken away from theology; and such scientific men make this assault on the assumption that physical sciences are fixed, certain, and exact. How ridiculous they make themselves, a review of the history of any science for the last fifty years would show. Is there any department of physical science in which a text-book used a quarter of a century ago would now be put into the hands of any student? The fact is that any man who is careful of his reputation has some trepidation in issuing a volume on science, lest the day his publishers announce his book the morning papers announce, also, a discovery which knocks the bottom out of all his arguments. This shows the great intellectual activity of the age—a matter to rejoice in, but a matter which should also promote humility and repress egotism in all well-ordered minds. There is, probably, no one thing known in its properties and accidents, in its relations to all abstract truths and concrete existence. No one thing is exactly and thoroughly known by any man, or by all men. Mr. Herbert Spencer well says: "Much of what we call science is not exact, and some of it, as physiology, can never become exact." (Recent Discussions, p. 158.) He might have made the remark with greater width and no less truth, since every day accumulates proof that that de-

partment of our knowledge which we call the exact sciences holds an increasingly small proportion to the whole domain of science.

There is one important truth which seems often ignored, and which should frequently be brought to our attention, viz.: that the propositions which embody our science are statements not of absolute truths, but of probabilities. Probabilities differ. There is that which is merely probable, and that which is more probable, and that which is still much more probable, and that which is so probable that our faculties cannot distinguish between this probability and absolute certainty; and so we act on it as if it were certain. But it is still only a "probability," and not a "certainty." It seems as though it would forever be impossible for us to determine how near a probability can approach a certainty without becoming identical with that certainty.

Is not all life a discipline of determining probabilities? It would seem that God intends that generally the certainties shall be known only to Himself. He has probably shown us a very few certainties, more for the purpose of furnishing the idea than for any practical purpose, as absolute certainty is necessary for Him, while probabilities are sufficient for us. All science is purely a classification of probabilities.

We do not *know* that the same result will follow the same act in its several repetitions, but *believe* that it will; and we believe it so firmly that if a professor had performed a successful experiment before a class of chemistry, he would not hesitate to repeat the experiment after a lapse of a quarter of a century. Scientific men are not infidels. Of no men may it be more truly said that they "walk by faith." They do not creep, they march. Their tread is on made ground, on probabilities; but they believe they shall be supported, and according to their faith so is it done unto them.

And no men better know than truly scientific men that this probability can never become certainty. In the wildest dreams of fanaticism—and there are fanatics in the laboratory, as there are in the sanctuary of God and in the temple of Mammon—it has never been believed that there shall come a man who shall know all things that are, all things that have been, all things that shall be, and all things that can be, in their properties, their attributes, and their relations. Until such a man shall

XUM

arise, science must always be concerned with the cognition of that which is the real truth as to probabilities, or with probable cognitions of that which is not only real truth, but absolute truth. A scientific writer, then, when he states that any proposition has been "proved" or anything "shown," means that it has been proved probable to some minds, or shown to some—perhaps to all—intelligent persons as probable. If he have sense and modesty, he can mean no more, although he does not cumber his pages or his speech with the constant repetition of that which is to be presumed, even as a Christian in making his appointments does not always say *Deo volente*, because it is understood that a Christian is a man always seeking to do what he thinks to be the will of God, in submission to the providence of God.

A scientific man ridicules the idea of any religious man claiming to be "orthodox." It must be admitted to be ridiculous, just as ridiculous as the claim of a scientific man to absolute certainty and unchangeableness for science. The more truly religious a man is, the more humble he is; the more he sees the deep things of God, the more he sees the shallow things of himself. He claims nothing positively. He certainly does not make that most arrogant of all claims, the claim to the prerogative of infinite intelligence. There can exist only one Being in the universe who is positively and absolutely orthodox, and that is God. In religion, as in science, we walk by faith; that is, we believe in the probabilities sufficiently to act upon them.

So far from any conflict being between science and religion, their bases are the same, their modes are similar, and their ends are identical, viz.: what all life seems to be; that is, a discipline of faith.

It is not proper to despise knowledge, however gained: whether from the exercise of the logical understanding, or from consciousness, or from faith; and these are the three sources of our knowledge. That which has been most undervalued is the chief of the three; that is, faith.

We *believe* before we acquire the habit of studying and analyzing our consciousnesses. We *believe* before we learn how to conduct the processes of our logical understanding.

We can have much knowledge by our faith without notice

of our consciousness, and without exertion of our reasoning faculties; but we can have no knowledge without faith. We can learn nothing from our examination of any consciousness without faith in some principle of observation, comparison, and memory. We can acquire no knowledge by our logical understanding without faith in the laws of mental operations.

This last statement, if true, places all science on the same basis with religion. Although so familiar to many minds, we may take time to show that it is true.

For proof let us go to a science which is supposed to demonstrate all its propositions, and examine a student in geometry. We will not call him out on the immortal 47 : I of Euclid. We can learn all we need from a bright boy who has been studying Euclid a week. The following may represent our colloquy:

Q. "Do you know how many right angles may be made by one straight line upon one side of another straight line?"

A. "Yes; two, and only two. Innumerable angles may be made by two straight lines so meeting, but the sum of all the possible angles will be two right angles."

Q. "You say you know that. How do you know that you know it?"

A. "Because I can prove it. A man knows every proposition which he can demonstrate."

Q. "Please prove it to me."

The student draws the well-known diagrams. If he follows Euclid, he begins with an argument like this:

A. "There are obviously two angles made when a straight line stands on another straight line."

Q. "My eyes show me that."

A. "Well, then, those angles are either two right angles or, together, are equal to two right angles. And I prove that in this way: If the two angles made by the lines be equal, each is a right angle according to the definition of a right angle, which may be stated thus: A right angle is one of the two angles made by a straight line on one side of another straight line when both angles are equal. If each is a right angle, and there are only two, because they have taken all the space on that side of the line, it is proved that two right angles are made by two lines in the relation supposed, and only two."

XUM

But if each be not a right angle, our young friend proceeds, by the well-known demonstration of Euclid, to show that the sum of the two angles is equal to two right angles; and when he has finished and reached the Q. E. D., he and his examiners *know* that this proposition is true, because he has proved it. But when we examine his argument we find that he has made three unproved assumptions, namely: (1) that a thing cannot at the same time *be* and *not be*; (2) that if equals be added to equals the wholes are equal; and (3) that things which are equal to the same are equal to one another. It so happens that each of these propositions which he has assumed to be true is, if true, much more important than the proposition which he has proved. Let us point out these three assumptions to our bright student, and then resume our catechism.

Q. "Could you possibly prove this proposition in geometry if any one of those three assumed propositions were not granted?"

A. "No."

Q. "Then, if we deny these assumptions, can you prove them?"

A. "No; but can you deny them?"

Q. "No, we cannot deny them, and cannot prove them; but we *believe* them, and therefore have granted them to you for argument, and know your proposition of the two right angles to be true, because you have proved it."

Now, here is the proposition which Euclid selected as the simplest of all demonstrable theorems of geometry, in the demonstration of which the logical understanding of a student cannot take the first step without the aid of faith.

From the student let us go to the master. We go to such a teacher as Euclid, and in the beginning he requires us to believe three propositions, without which there can be no geometry, but which have never been proved, and, in the nature of things, it would seem never could be proved—namely, that space is infinite in extent, that space is infinitely divisible, and that space is infinitely continuous. And we believe them, and use that faith as knowledge, and no more distrust it than we do the results of our logical understandings, and are obliged to admit that geometry lays its broad foundations on our faith.

Now, geometry is the science which treats of forms in their relations in space. The value of such a science for intellectual culture and practical life must be indescribably important, as might be shown in a million of instances. No form can exist without boundaries, no boundaries without lines, no line without points. The beginning of geometric knowledge, then, lies in knowing what a "point" is, the existence of forms depending, it is said, upon the motion of points. The first utterance of geometry, therefore, must be a definition of a point. And here it is: "A point is that which has no parts, or which has no magnitude." At the threshold of this science we meet with a mystery. "A point is"—then it has existence—"is" what? In fact, in form, in substance, it is nothing. A logical definition requires that the *genus* and *differentia* shall be given. What is the *genus* of a "point"? Position, of course. Its *differentia* is plainly seen. It is distinguished from everything else in this, that everything else is *something somewhere*, and a point is *nothing somewhere;* everything HAS *some* characteristic, a point has *none*. A point is either visible or invisible. Is it visible? Then we can see that which is without parts or magnitude. What is it we see when we do not see any part, do not see any magnitude? Is it substantial or ideal? If substantial, how do we detect its substantial existence? If ideal, how can an idea have motion, and by simple motion become a substantial existence? Are we not reduced to this? Ideals produce substantials, or invisible substantials, upon motion, produce visible substantials; or that which is necessary to matter—namely, form—owes its existence to that which is neither substantial nor ideal—to nothing, in fact. The entire and sublime science of geometry, at one time the only instrument of culture among the Greeks, and so esteemed by Plato that he is said to have written over his door, "Let no one enter here who does not know geometry," in all its conceptions, propositions, and demonstrations, rests upon the conception of that which has no parts, no magnitude. The old saw of the schoolmen was, "Ex nihilo nihil fit." If each visible solid owes its form to superficies, and each superficies its form to lines, and each line its form to a point—and a point has no form, because it has no parts—then who shall stone the man who cries out, "Ex nihilo geometria fit"?

XUM

But lay the first three definitions of geometry side by side: 1. "A point is that which has no parts, or which has no magnitude." 2. "A line is length without breadth." 3. "The extremities of a line are points." Study these, and you will probably get the following results: That which has no parts produces all the parts of that which occupies space without occupying space, and which, although it occupies no space, has extremities, to the existence of which it owes its own existence; and those extremities determine the existence of that which has parts made up by multiplications of its extremities which have no parts. Now, you must know at least that much, or else you must stay out of Plato's house.

This useful science, without which men could not measure their little plantations, or construct their little roads on earth, much less traverse and triangulate the ample fields of the skies, lays for its necessary foundation thirty-five definitions, three postulates, and twelve axioms, the last being propositions which no man has ever proved; and these fifty sentences contain as much that is incomprehensible, as much that must be granted without being proved, as much that must be believed, although it cannot be proved, as can be found in all the theological and religious writings from those of John Scotus Erigina down to those of Richard Watson, of England, or Charles Hodge, of Princeton.

Does any man charge that this is a mere logical juggle? Then he shall be called upon to point out wherein it differs from the methods of those who strive to show that there is a real conflict between real science and real religion. If any man shall charge me with being an infidel as touching geometry, and try to turn me out of the church of science, I shall become hotly indignant, because I know that Euclid did not believe more in geometry than I do, and I believe as much in the teachings of geometry as I do in the teachings of theology, regarding them both, as Aristotle did, as mere human sciences, ranking theology with psychology, geology, and botany. And being by profession, if not by attainments, a theologian, I certainly believe in theology.

And this brings us back to what was stated in the begin-

ning as one of the causes of this cry of "conflict." It is the confounding of theology with religion. Theology is not religion any more than psychology is human life, or zoölogy is animal life, or botany is vegetable life. Theology is a human science; religion is a real life. Theology is objective; religion is subjective. Theology is the scientific classification of what is known of God; religion is a loving obedience to God's commandments. Every religious man must have some theology, but it does not follow that every theologian must have some religion. We never knew a religious man without some kind of a theology, nor can we conceive such a case. But we do know some theologians who have little religion, and some that seem to have none. There may be a conflict between theology and some other sciences, and religious men may deplore *that* conflict, or may not, according to their measure of faith. There are those whose faith is so large and strong that they do not deplore such a conflict, because they know that if, for instance, a conflict should come between geology and theology, and geology should be beaten, it will be so much the better for religion; and if geology should beat theology, still so much the better for religion: according to the spirit of the old Arabic adage, *If the pitcher fall on the stone, so much the worse for the pitcher; and if the stone fall on the pitcher, so much the worse for the pitcher.* Geologists, psychologists, and theologists must all ultimately promote the cause of religion, because they must confirm one another's truths, and explode one another's errors; and a religious man is a man whose soul longs for the truth, who loves truth because he loves God, who knows if the soul be sanctified it must be sanctified by the truth, even as the mind must be enlarged and strengthened by the truth. He knows and feels that it would be as irreligious in him to reject any truth found in nature as it would be for another to reject any truth found in the Bible.

But there is no necessary conflict between even theology and any other science. Theology has to deal with problems into which the element of the infinite enters. It will therefore have concepts some two of which will be irreconcilable, but not therefore contradictory. For instance, to say that God is "an infinite person" is to state the agreement of two concepts

which the human mind is supposed never to have reconciled, and never to be able to reconcile. But they are not contradictory. If one should say that there is in the universe a circular triangle, we should deny it, not because the concept of a triangle is *irreconcilable* with the concept of a circle, as consistent in the same figure, which is quite true, but because they are *contradictory*. What is irreconcilable to you may be reconcilable to another mind, because "irreconcilable" indicates the relation of the concept to the individual intellect; but what is contradictory to the feeblest is contradictory to the mightiest mind, because "contradictory" represents the relation of the concepts to one another.

In the definition of a *person* there is nothing to exclude infinity, and in the definition of *infinite* there is nothing to exclude personality. There is no more exclusion between "person" and "infinite" than between "line" and "infinite;" and yet we talk of infinite lines, knowing the irreconcilability of the ideas, but never regarding them as contradictory.

Writers of great ability sometimes fall into this indiscrimination. For instance, a writer whom I greatly admire, Dr. Hill, former President of Harvard College, in one paragraph[1] seems twice to employ "contradictory" in an illogical sense, even when he is presenting an illustration which goes to show most clearly that in other sciences, as well as in theology, there are propositions which we cannot refuse to accept, because they are not contradictory, although they are irreconcilable; in other words, that there are irreconcilable concepts which are not contradictory, for we always reject one or the other of two contradictory concepts or propositions.

That is so striking an illustration of the mystery of the infinite that I will reproduce it. On a plane imagine a fixed line, pointing north and south. Intersect this at an angle of ninety degrees by another line, pointing east and west. Let this latter rotate at the point of intersection, and at the beginning be a foot long. At each approach of the rotating line toward the stationary line let the former double its length. Let each approach be made by bisecting the angle. At the

[1] In an admirable article on "The Uses of Mathesis," in the *Bibliotheca Sacra* for July, 1875.

first movement the angle would be forty-five degrees and the line two feet in length; at the second, the angle twenty-two and one-half degrees and the line four feet; at the third, the angle eleven and one-fourth degrees and the line eight feet; at the fourth, the angle five and five-eighths degrees and the line sixteen feet; at the fifth, the angle two and thirteen-sixteenths degrees and the line thirty-two feet, and so on. Now, as this bisecting of the angle can go on indefinitely before the rotating line can touch the stationary line at all its points, it follows that before such contact the rotating line will have a length which cannot be stated in figures, and which defies all human computation. It can be mathematically demonstrated that a line so rotating, and increasing its length in the inverse ratio of its angle with the meridian, will have its end always receding from the meridian and approaching a line parallel to the meridian at a distance of 1.5708. We can show that the rotating line can cross the stationary line by making it do so as on a watch-dial, and yet we can demonstrate that if it be extended indefinitely it can never touch the stationary line, nor come at the end even as near as eighteen inches to it.

Here are two of the simplest human conceptions, between which we know that there is no contradiction, rendered absolutely irreconcilable to the human intellect by the introduction of the infinite. There is no religion here. And yet there is no mystery in either theology or religion more mysterious than the mystery of the infinite, which we may encounter whenever we attempt to set our watches to the right time if they have run more than an hour wrong.

Another error has been the occasion of this cry of "conflict." It is the confounding of "the Church" with "religion." This confusion has led many an honest soul astray, and is the fallacy wherewith shrewd sophists have been able to overthrow the faith of the ignorant. If the Church—and, in all my treatment of this topic, I must be understood as using "the Church" not as signifying "the holy Church universal," but simply in the sense in which antagonistic scientists employ it—if *the Church* and *religion* be the same, the whole argument must be given up, and it must be admitted that there is a conflict between religion and science, and that religion is in the wrong.

Churchmen are guilty of helping to strengthen, if indeed they are not responsible for creating, this error. It has at length been presented plumply to the world in the book of Professor John William Draper, entitled a "History of the Conflict between Religion and Science." The title assumes that there is such a conflict. See how it will read with synonyms substituted: "History of the Conflict between *Loving Obedience to God's Word* and *Intelligent Study of God's Works*." Does Dr. Draper believe there is such a conflict? It is not to be supposed that he does. How, then, did he come to give his book such a title? From a confusion of terms, as will be observed by the perusal of three successive sentences in his preface: "The *papacy* represents the ideas and aspirations of two-thirds of the population of Europe. It insists on a political supremacy, ... loudly declaring that it will accept no reconciliation with modern civilization. The antagonism we *thus* witness between *religion* and science," etc. Now, if "the papacy" and "religion" be synonymous terms, representing equivalent ideas, and if all the things which Dr. Draper asserts to be facts are facts,[1] Dr. Draper's book shows that all good men should do what they can to extirpate religion from the world; but if they are not—and learned and holy Roman Catholics may readily affirm that they are not—then the book is founded on a most hurtful fallacy, and must be widely mischievous. Their share of the responsibility for the harm done must fall to those Churchmen who have spoken without considering the end to which their unwise claims must logically drive them.

No, these are not synonymous terms. "The Church" is *not* religion, and religion is *not* "the Church." There may be a Church and no religion; there may be religion and no Church, as there may be an aqueduct without water, and there be water without an aqueduct. God makes water, and men make aqueducts. Water was before aqueducts, and religion before Churches. God makes religion, and men make Churches. There are irreligious men in every Church, and there are very religious men in no Church. Any visible, organized Church is

[1] But no writer has appeared in the last half century whose statements are more reckless. It would be safe for every young reader to verify each statement made in the "History of the Conflict" before accepting it.

a mere human institution. It is useful for the purpose of propagating religion so long as it confines itself to that function and abstains from all other things. The moment it transcends that limit, it is an injurious institution. In either case it is merely human, and we wrong both religion and the Church when we claim for the latter that it is not a human institution. The Church of England is as much a human institution as the Royal Society; and the same may be said of the Church of Rome and the Royal Florentine Academy. A Church is as much an authority in matters of religion as a society is in matters of science, and no more. "The Church" has often been opposed to science, and so it has to religion; but "the society" has often been opposed to religion, and so it has to science. "The Church," both before and since the days of Christ, has stood in opposition to the Bible, the text-book of Jewish and Christian religionists, quite as often as it has to science. But "the society," or "the academy," has stood in opposition to science quite as often as it has to religion. Sometimes the sin of one has been laid upon the other, and sometimes the property of one has been scheduled as the assets of the other. It is time to protest, in the interests of the truth of God, and in the name of the God of truth, that religion no longer be saddled with all the faults of the Churchmen, all the follies of the scientists, and all the crimes of the politicians. It was not religion which brought Galileo to his humiliating retraction, about which we hear so much declamation; it was "the Church."

But why should writers of the history of science so frequently conceal the fact that "the Church" was instigated thereunto not by religious people, but scientific men—by Galileo's *collaborateurs?* It was the jealousy of the scientists which made use of the bigotry of the Churchmen to degrade a rival in science. They began their attacks not on the ground that religion was in danger, but on such scientific grounds as these, stated by a professor in the University of Padua—namely, that as there were only seven metals, and seven days in the week, and seven apertures in man's head, there could be only seven planets![1] And that was some time before these

[1] It is scarcely to be wondered that the churchmen should follow the lead of the scientific men, and attack the new system by showing that all the Scriptural

gentlemen of science had instigated the sarcastic Dominican monk to attempt to preach Galileo down under the text, "Viri Galilæi, quid statis adspicientes in cœlum?"[1]

In like manner, politicians have used "the Church" to overthrow their rivals. "The Church" is the engine which has been turned against freedom, against science, against religion. It would be as logical and as fair to lay all "the Church's" outrages against human rights and intellectual advancement at the door of religion as it would be to lay all its outrages against religion at the door of science and government, because "the Church" has seldom slaughtered a holy martyr to the truth without employing some forms of both law and logic.

Science exists for the sake of religion, and because of religion. If there had been no love for God in the human race, there had been no study of the physical universe. The visible cosmos is God's love-letter to man, and religion seeks to probe every corner of the sheet on which such love is written, to examine every phrase and study every connection. A few upstarts of the present day, not the real men and masters of science, ignore the fact that almost every man who has made any great original contribution to science, since the revival of letters, was a very religious man; but their weak wickedness must not be charged to science any more than the wicked weakness of ecclesiastics to religion.

Copernicus (born 1473), who revolutionized astronomy, was one of the purest Christians who ever lived—a simple, laborious minister of religion, walking beneficently among the poor by day, and living among the stars by night; and yet one writer of our day has dared to say, in what he takes to be the interest of

types applicable to the case proved the existence of only seven planets, such as the seven-branched candlestick of the tabernacle, the seven candlesticks of the Apocalypse, and the seven churches of Asia. See *Delambre.*

[1] A poor pun on the name of Galileo. "Ye men of Galilee, why stand ye gazing up into heaven?" (Acts i. 11.) This sermon by Caccini was not altogether funny. Delambre represents the conclusion of it ferocious. (*Histoire de l'Astron.*, dis. prelim. p. xxii.) In regard to this matter of Galileo, President White well says: "The whole of the civilized world was at fault, Protestant as well as Catholic, and not any particular part of it. *It was not the fault of religion*, it was the fault of the short-sighted views which narrow-minded, loud-voiced men are ever prone to mix in with religion, and to insist is religion." (*Popular Science Monthly*, Feb. 1876, p. 399.)

science, that Copernicus was "aware that his doctrines were totally opposed to revealed truth." Was anything worse than this absurd slander of a great dead man ever perpetrated by theologian, or even ecclesiastic? Could *any* man believe in any doctrine which he *knew* was opposed to any truth, especially if he believed that God had revealed that truth? It were impossible, especially with a man having the splendid intellect and the pure heart of Copernicus, who died believing in his "De Orbium Cœlestium Revolutionibus," and also in the Bible. And this is the touching inscription which that humble Christian ordered for his tomb: "Non parem Paulo veniam requiro, gratiam Petri neque posco; sed quam in crucis ligno dederis latroni, sedulus oro." [1]

Tycho Brahe (born 1546), who, although he did not produce a system which won acceptance, did, nevertheless, lay the foundation for practical astronomy, and build the stairs on which Kepler mounted to his grand discoveries, was a most religious man. He introduces into one of his scientific works ("Astronomiæ Instauratio Mechanica," p. A) this sentence: "No man can be made happy, and enjoy immortal life, but through the merits of Christ, the Redeemer, the Son of God, and by the study of his doctrines, and imitation of his example."

John Kepler (born 1571) was a man in whose life the only conflict between science and religion seemed to be as to which should yield the most assistance to the other. He wrought as under Luther's motto, "Orasse est studisse." He prayed before he worked, and shouted afterward—such shouts as this, which came when the orderly grandeur of the universe burst on him: "I am thinking the thoughts of God." [2] The more he bowed his soul in prayer, the higher his intellect rose in its discoveries; and as those discoveries thickened on his head, it bowed in humbler adoration. And so that single man was able to do more for science than all the irreligious scientists of the last three centuries have accomplished, while he bore an appalling

[1] "I ask not the favor accorded to Paul, nor demand the grace granted to Peter, but I pray earnestly for that which Thou didst give to the thief on the cross."

[2] In the same spirit Linnæus exclaimed, "Deum omnipotentem a tergo transeuntem et obstupui"—*I have beheld the back part of God Almighty as he passed, and have been astounded.* Possibly the passage at the conclusion of Exodus xxxiii. was in his mind.

XUM

load of suffering with a patience that was sublime, and, dying, left this epitaph for his tomb-stone: "In Christo pie obiit."

Of Sir Isaac Newton's, and Michael Faraday's, and Sir William Hamilton's, and Sir James Y. Simpson's religious life, not to mention the whole cloud of witnesses, we need not tell what is known to all men. But the history of science shows that not the most gifted, not the most learned, not the most industrious, gain the loftiest vision, but that only the pure in heart see God. And all true science is a new sight of God.

Herbert Spencer says: "Science may be called an extension of the perceptions by means of reasoning" (Recent Discussions, p. 60). And we may add, Religion may be called an extension of the perceptions by means of faith. And having so said, have we not paraphrased Paul? "Faith is confidence in things hoped for, conviction of things not seen" (Heb. xi. 1). Science has the finite for its domain, religion the infinite; science deals with the things seen, and religion with the things not seen. When Dr. Hutton, of Edinburgh, announced, in the last century, "In the economy of the world I can find no traces of a beginning, no prospect of an end," it is said that scientific men were startled and religious men were shocked. Why should they be? The creation of the universe and its end are not questions of science, and can be known only as revealed to faith. And so Paul says: "Through faith we apprehend intellectually that the worlds have been framed by the word of God, so that that which is seen may have sprung from that which is not seen" (Heb. xi. 3).

But we must close.

While preparing this paper it has been my almost daily custom to pass the massive Masonic Temple in the city of New York. Before its portals stand two stately columns, known to the brethren of the Masonic Order as Jachin and Boaz. On each rests a globe. In going to my study in the morning I pass first the column which supports the celestial globe, and as I return to my home in the evening I pass first the column which supports the terrestrial globe. One day it came to me that here there stood, in solid symmetry and solemn resemblance, the symbols of these twins of God, who did not struggle in the infinite

womb as Isaac's sons contended before they were born, and whose children should not fight on the fields of the finite as the descendants of Jacob and Esau have contended for inheritances which are corruptible and which pass away.

The most sacred thing in the *sanctum sanctorum* of the ancient Hebrew tabernacle and temple was the Ark of the Covenant, the Law, God's testimony to his sense of right, the solitary autograph in human letters of the Eternal, written on stone, inscribed by the very fingers of the Lord God Almighty. Over the Ark which held the Law, God ordered that a Mercy-seat should be placed. "His tender mercies are over all his works," and so his Mercy-seat covered his Testimony. When Adam and Eve had been driven forth, the cherubim had stood at Eden's gate, while a flaming sword turned every way. They were placed there as guardians to keep the way of the tree of life. In the tabernacle the cherubim reappear, but come without the sword, stretching forth their wings on high, covering the Mercy-seat with their wings, and gazing down on the awful mystery of Love overlapping Law, and Law upholding Love.

Behold, I have a vision of the cherubim.

The Ark is carried into the temple not made with hands, eternal in the heavens. The cherubim are instinct with life to the outermost tip of each mighty pinion. The very glory of God descends to make his everlasting throne upon the everlasting Mercy-seat, which covers the everlasting Seat of Law. Before the infinite majesty of that Glory the cherubim arise, and stand in front of God; and, as they arise, the sounds of their quivering wings are heard to the outer court of all the temple of the universe, as the voice of the Almighty God when he speaketh.

See how they stand, so vast and so superb!

The One who has the place by the right hand of the Omnipotent lifts up himself, and all the glory of all the suns is on his brow, and each great wing is like an unmeasured milky-way, a-shimmer with the mystic splendor of all stars.

The One who has the place nearest the infinite heart of Immortal Love lifts up himself. His brow is fairer than the light of that morning when all the sons of God shouted for joy. His eyes are lovelier than the sapphired tent that pavilions the eter-

nal throne. His lips are ravishingly sweet with the best beauty that comes from the kisses of the Lord. His wings are pinions whose plumes of whiteness shed thoughts of purity down on angelic minds, and whose immense sweep fans all the love-flames glowing in seraphic hearts.

Twain they stand and twain they turn, until hierarchic circles kindle into rapture at the sight. Even God delights himself in their surpassing glory, and smiles upon them until their vast hearts can no longer hold their divinest joy.

Twain they sing. The cherub of the snow-white wings and palpitating heart breaks heaven's ecstatic silence with the chant, "Holy, Holy, Holy, Lord God of Hosts!"

The cherub of the starry wings and throbbing brain gives antiphone, "Heaven and earth are full of the majesty of thy glory."

The heavens can keep silence no more, but seraphim and cherubim, angels and archangels, shout, shout up at the throne of Love and Law, "Glory be to thee, O Lord Most High!" and from the farthest reach of thought and feeling, all the company of heaven fill the temple of God with the multitudinous and musical thunder of the united and overwhelming "Amen, and Amen!"

And the King, eternal, immortal, invisible, the only wise God our Saviour, wraps those interlocked cherubim in his loving arms, and thrills the heavens with his royal edict, "What God hath joined together let not man put asunder."

Those cherubim sublime are science and religion. As they had no struggle with each other when God gave them birth, as they had no conflict guarding the Ark of Law and Love, as they shall have no discord when leading the choirs of eternity, so they have no conflict now.

In being present at the opening of the School of Christian Philosophy, we have assembled to begin a labor intended to increase the light which shall make all thoughtful people see that he who sets forth that there is any real conflict between real Science and real Religion thereby demonstrates that he has failed to comprehend the function of Science or failed to apprehend the spirit of Religion.

WHAT WE MEAN BY CHRISTIAN PHILOSOPHY.

[A Lecture delivered before the Summer School of Christian Philosophy, 13th July, 1881.]

By Noah Porter, D.D., LL.D.,
President of Yale College.

I AM aware, as many of you must be, that the phrase Christian Philosophy is rejected by many well-meaning and truth-loving men as unmeaning and unscientific. They would urge in objection that a philosophy committed beforehand to the support of Christianity must thereby sacrifice its scientific independence. Moreover, Christianity is in its form a historic narrative, a simple record of facts, a story of events, a portraiture of persons; what can it possibly have to do with philosophy, which concerns itself only with forces and principles and laws? Then, again, the events and personages which Christianity records are supernatural, whereas science and philosophy know nothing of the supernatural, but are limited altogether to those forces which are natural and those laws which are constant and fixed. Philosophy also addresses itself to the Reason, whose principles of evidence are clear and unchangeable, and whose methods of inquiry are definite and uncompromising. Christianity also appeals to Faith, which, whatever it may be as a form of belief or conviction, is neither compelled by demonstration nor silenced by experiment. The spirit of Science is aggressive and self-relying. The spirit of Christianity is self-dis-

XUM

trustful and confiding. Christian knowledge, moreover, thrives in the sphere of emotion and aspiration. It requires and rejoices in the genial warmth of the affections and the hopes. But science admits no other light than the cool and dry light of reason; it shrinks from every influence that does not either justify or compel conviction. To finish the argument, Christianity has jealously withstood every advance of science which has questioned its dogmas, and every attempt of philosophy to try its conclusions by verifying tests and processes. Science has made progress just in proportion as it has been indifferent to these fears or braved this hostility. For these reasons there can be no propriety in recognizing any philosophy as Christian. It should be esteemed a positive offence and dishonor to science to teach any of its principles in the interest of, or with any reference to, the Christian faith. It follows that each can serve itself best by leaving the other to itself. Each should be content with its own methods, its own criteria of truth, and its own conclusions, and be entirely unconcerned with any possible relations which it may hold to the other. These views are not held by scientists and philosophers only. They are accepted and enforced by not a few Christian thinkers, and in the interests of their faith. Whatever may be the spirit in which these views are held, it cannot be overlooked or denied that they are extensively received and earnestly propounded by many scientists on the one hand and Christian theologians on the other.

I propose briefly to inquire how far these views are just, and in doing so to ask whether there is any such thing as a Christian philosophy, and if there is, what are its limits and its extent, what subjects it excludes and what it embraces within its sphere, what are its methods of inquiry and its grounds of conviction.

I. I would ask you to consider *first* that Christianity is *more* than a history. It is, indeed, a record of facts and events. But these facts and events are significant and important only as they relate to important principles and truths. They do not prove these principles, but they assume them to be true—as

that there is a personal and self-existent Creator, the originator of the forces and the upholder of the laws of nature, who can be known by man, who is interested in man, and can be honored and loved by man; that man is morally responsible to himself and therefore to God, and needs guidance and help from God; that he is destined to, and capable of, another life. It is to man as such a being that God reveals himself, according to the Christian story. It is these truths concerning God and man which give to the events of this history all their significance and interest.

II. Not only does Christianity assume these truths. It also *enforces* them. Rather it assumes them that it may enforce them, if its story is true, by the most impressive and moving of all manifestations of a personal character, which touch the affections and conscience and arouse and stimulate all the springs of action. True, it does not utter these truths in the language of the schools. It scarcely propounds or recognizes them in abstract language at all, but it impersonates them in living beings, whose looks and words and acts move to a believing and loving response. But the truths and principles, for all that, are ever present and give to these personal acts and words all their meaning and interest.

III. Every one of these truths has some possible or actual relation to scientific thought. As a consequence, Christianity is brought into permanent relations to philosophy. Let any one of these principles be set aside as impossible or false, and the Christian history becomes at once untrue and insignificant. Let philosophy show to its own satisfaction that God is a fiction of the fancy or an impersonal force, or that he is only a name for the universe itself as an organic whole, or that while he exists he cannot be known, or that so far as he is known he must be falsely known, or that man is without moral freedom and therefore incapable of moral responsibility, or that the future existence of man is scientifically impossible,—and the interest and force of the Christian story are necessarily set aside. It becomes nothing but an interesting record of a faith that once

XUM

was living but now is dead. What had been a temple filled with believing worshippers becomes a mausoleum in which the curious stranger hears the hollow echoes of his solitary footfalls as he walks over the tombs below,—in which all who once worshipped above now sleep beneath, and with them are buried forever all that made the temple a hallowed fane.

IV. These truths, if they need any proof or are capable of being proved, are in no sense dependent on the testimony of Christianity, but must be tried at the bar of philosophy. When we say they must be tried in these courts, we do not assert that the evidence on which they rest is either demonstrative or experimental. It may be neither. It may be of a kind peculiar to itself. It may be intuitional and self-sufficing, or possibly, so far as our argument goes, supernatural. We care not to inquire or to answer, so long as it is clear that philosophy must either pass judgment upon the evidence as satisfactory, or at least as not inconsistent with its previous decisions, or must send the case to a court to which it allows jurisdiction concurrent to faith itself.

V. For these reasons the principles of Christian philosophy are easily, and they ought to be carefully, distinguished from the truths of Christian theology. The truths of theology are, and those of philosophy are not, supported by testimony. The relations of the two to scientific evidence and proof are for this reason unlike. We grant that truths of theology proper, when accepted on testimony and by faith, hold an important relation to philosophy in that they must be believed to be scientifically possible and credible, and to a certain extent must be defined and explained and arranged after scientific methods. Every system of theology seeks to be in this sense scientific. Every catechism is an introduction to the science of Christian theology. So far as Christian truths are defined and explained they constitute such a science, whether the principles are received on the authority of the Scriptures, of tradition, or of the Church. On the other hand Christian philosophy limits itself to those truths, and to those relations of truths—whether they are historical or revealed, personal or supernatural—which in some

XUM

sense shine by their own light or rest on the evidence of Reason.

VI. The nature of Christian philosophy is brought into bolder relief by the fact that its distinctive principles have been held by not a few men who did not accept Christianity as historically true or in any sense as supernatural. Socrates, Plato, Marcus Antoninus, Theodore Parker, Francis Newman, are by no means isolated examples. Men such as they have not held these truths by intellectual belief alone, but with a fervid personal faith. But they held them as philosophers by a necessity and conviction that were intellectual and a logical consistency that was scientific. They carried these principles into their theory of the universe, both the physical and the spiritual, adjusting to them their judgments of nature and the soul, of man's history and man's destiny, of society, government, and law, of the ideal of human life and attainment, thus bringing their applications into intellectual consistency, and binding their conclusions into a more or less coherent scientific system.

VII. In like manner there have been held in ethnic and Christian schools a variety of theories antagonistic to and destructive of what we call a Christian philosophy—theories which have denied thought or purpose in the universe, and substituted blind force for intelligent origination; which have resolved the order of the kosmos into the struggling forces of self-existing and self-impelled atoms, that swim in the chaos of their drowned compeers; which have denied any care for man, or power to help, on the part of God; which have excluded from man any foundation for moral self-respect or moral responsibility, and have bravely accepted and frankly avowed the consequences of their theories in some one of the manifold varieties of materialistic atheism. We cite Democritus, Lucretius, and Hobbes as holding theories of this sort. We might cite not a few now living were it not easy for such to disown affinity with the older atheists by a newly invented terminology for very similar principles. The fact that Christianity makes these truths more definite and vivid, and reinforces them with new effect, and invests them with the glow and fire of personal energy, does

XUM

not make these truths to be any less philosophical in their nature any more than the fact that some non-Christians hold them makes it improper to speak of a Christian philosophy.

Why then, it may be asked, if this philosophy may be and has been held by those who receive and those who do not receive the Christian faith—why call it distinctively Christian philosophy?

1. To this question we answer: Because it is a simple matter of fact that Christianity first forced these truths effectually upon the world's attention and the world's acceptance by means of its supernatural claims and its supernatural history, and caused them to be largely accepted as principles of the world's philosophy which now commend themselves to man's reason and shine by their own light. In defending itself, Christianity has been forced to defend these truths on grounds of reason against the attacks of subtle and powerful antagonists, and sharply and still more sharply to define them, under the unsparing scrutiny of keen-sighted critics. In these attacks and defences these truths have been brought into every conceivable relation to other truths and theories of science and religion. When the discussions have seemed to be purely theological, they have very often, if not more frequently, turned upon some principle of this underlying philosophy. It does not follow because Christianity has inwrought certain truths into the world's philosophy, that it has taught them by authority or enforced them by miracle or testimony. This inference is excluded by the undisputed fact that in its use of miracle and testimony Christianity assumes these principles to be accepted and to be necessary in order to give force or significance to miracle or history, and that again and again it has rested its cause on grounds of philosophy alone. Much is said in these days of the hindrance which Christian theology has been to science and philosophy. Much might be said of the stimulus and aid which it has given to both in a moral and intellectual way.

2. Not only has philosophy been stimulated and shaped by the earnest thinking of Christendom upon Christian themes,

but it has moulded Christian civilization and organized Christian institutions. The civilization and institutions of modern life are the products of Christian ideas, to a large extent of the positive and supernatural facts which Christianity asserts, but always of the great verities which give these facts their significance. The amenities, the manners, the legislation, and the jurisprudence of modern life are the always blooming flowers and the ever ripening fruit of the ideas of God, of the soul, of duty, and of immortality which Christianity has made sacred and energetic. In other words, Christianity has given the world a peculiar and practical philosophy of belief and of life, which has become a new atmosphere for its thinking and feeling. This atmosphere pervades the streets of every city, it is diffused over wide spaces where man dwells far from man, carrying protection and courtesy and honor and truth where otherwise lawless violence and brutal rudeness would have been unrestrained. The complicated organism of modern life, which we call its credit and its commerce, its culture and its arts, its morality and its refinement, is constantly renewed by the force of these ideas of Christian philosophy, which are the life-forces of the ever growing and ever more ramified structure: as the oak which has stood for centuries feels the force of one life through every fibre and leaflet and bud. Let these ideas fail, by the prevalence of an anti-Christian philosophy, or let them be weakened in their force, and the structure will lose its coherence and show by its slow or sudden ruin how powerful and necessary to its existence were the truths that gave it strength and beauty. We may *conceive*, if we do not believe, that faith in Christianity as *a supernatural force* should die out, and the strength and beauty of modern life should remain, but we can neither conceive nor believe that faith in the truths of Christian philosophy should fail and this fair structure should escape the dry-rot which must slowly sap its strength, or the swift ruin which would attend its sudden fall.

3. Christian philosophy, however, like philosophy in general, should be sharply distinguished from any one of the special sciences. It would be absurd and unmeaning to speak of

Christian physics, or Christian mathematics, or Christian geology, but it by no means follows that it is unreasonable to speak of Christian philosophy. The reason is obvious. Every single science is limited to a special class of phenomena and certain easily distinguished powers and laws. Philosophy concerns itself with those powers and relations which are common to many phenomena and which are the conditions of every special science and of all scientific knowledge. A special science may be prosecuted without either asking or answering the question whether there is a God or whether the spiritual agent, vulgarly called the human mind, that builds its knowledge into a science can be material in its essence or evolved from matter, or what are the grounds of its belief in the order of nature, or is there a purpose or design in the universe, or can the soul survive the body. These questions are more or less properly questions of philosophy, as it is distinguished from any one of the sciences. That this distinction is well taken will appear from a few examples. Physics is limited to mechanical or molecular forces and the bodies in which they inhere. It treats of adhesion and impulse and pressure in molecules and masses and liquids; of *matter* as its parts cohere in solids or flow in liquids or are repelled in gases, as it undulates in light or expands and glows in heat or palpitates in electricity, as it manifests force now as heat or electricity or light, or capacity for mechanical work. Chemistry, again, has to do with another set of properties and relations by which two or more elements unite in a result unlike either, and attract and repel each other in definite proportions.

Physiology has to do with another set of activities and relations by which living tissues are formed that manifest peculiar properties and organs which perform special functions. Mathematics, again, has to do with *pure* quantity as conceived by the mind, as in geometry and algebra, and with applied quantity as in mensuration, surveying, engineering, gunnery, and other arts of man; or on a larger scale in astronomy, that measures and weighs the celestial masses in their movements and predicts their places; or in chemistry, that combines and repels its molecules in strictest obedience to the relations of number by

a skill and thought even more consummate—if indeed the vast universe of masses and the minute universe of molecules have a thinker at all.

The agents and powers with which physics, chemistry, and physiology are concerned exist together in the same universe and have some common relations with one another. Mathematics has relations common to all, for its quantities are recognized in all and applied to all. Inquiries respecting the conceptions that enter into each of the several sciences, whether they are assumed as existing in the universe or as governing the mind of the scientific inquirer in his efforts to interpret the secrets of nature, necessarily define the bounds of philosophy as distinguished from science.

Such inquiries will compel us to ask whether thought or blind force originated and rules the universe; whether man who interprets the universe can intelligently solve its riddles, or whether he is always impelled to guess whether he shall outlive the matter over which his triumphant thought and skill is perpetually proclaiming him master and king. That there is such a science, or, which is the science of the sciences, the *prima philosophia*, has been recognized by all thinkers from Aristotle down to Huxley and Tyndall.

It is not my object to define or describe this underlying and fundamental branch of knowledge, or to insist that philosophy is its fitting name. I desire only to show that it exists or ought to, and that it proposes and seeks to answer the most interesting and important questions which can occupy man's intellect or which concern his destiny.

4. These points being established, I proceed to say that a man may be a very eminent scientist without being an eminent philosopher. He may even be pre-eminent in his mastery of a single science without giving special attention to the philosophy of that very science of which he is master. To be eminent in astronomy or physics or chemistry or physiology, one needs only to accept the conceptions and definitions which the great discoverers have gained, without inquiring into the exactness of the definitions or the consistency of one definition with another—

much less without asking or answering any questions concerning the relations of his own science to other sciences or to the sciences in general. These sciences are very largely sciences of observation and experiment, and they permit the amplest range for the energy of the most zealous devotee, who would be hindered and distracted if he concerned himself with their underlying philosophy. It is only the more inquisitive minds, the minds of larger and more generous spirit, which cannot be restrained from searching after the authority of the principles and laws which he is daily and hourly applying.

Even in the pure mathematics—the science of abstractions, whose elemental air is transparent ether itself—a man may be eminent in resolving problems and inventing theorems, who accepts the axioms without asking after their authority, and uses the definitions without inquiring concerning their fitness,—much more without ever caring to ask what is the mental process by which the mind gets possession of *the point, the line, the circle, the cube, or the sphere;* or what is that mysterious entity which men call space, in which these geometrical constructions seem to float as fish in the sea, and to which the reasoner is always referring whether he knows it or not.

5. If now we turn to the special sciences which concern themselves with the human spirit, we find them lying nearer to philosophy, as we use the term, than the physical sciences in which observation and experiment test every theory and try every definition. It is not true that the phenomena of knowledge and feeling are energies any the less real or potent than are the manifestations of gravitation or electricity. It is true, however, that electricity and gravitation are nothing except so far as they are known. The act of knowing is superior to all others, because it is the agency by which nature reappears in the form of a demonstrated science, or is explained by a sagacious theory such as the leaders of science are now and then inspired to frame, as that of Copernicus and Newton and Faraday and possibly Darwin, or is tested by decisive experiments such as Franklin and Davy have devised by skilful invention. The agency of knowledge in interpreting nature is as real and potent an agency

as any of the powers of nature which it brings out of its hiding-place and forces to declare the secret of her working. If the power of knowing is as real as any force which is known, it is not lower but higher in rank, because it cannot itself be tasted or seen or touched or weighed by the pound or measured by the inch. Only let us remember that itself sees and touches and weighs and measures, not gravitation and electricity alone, but every property and relation in the universe, from any of the single forces which, as light and heat, pervade all space to any momentary combination of one or more under which the gossamer floats and glistens in the sunbeam, or which whirls the smaller atom or molecule around its centre, or hurls the gaseous particles with tiny but unfelt strokes against the silken walls which they expand but cannot break.

Is mental force any the less real or less worthy of scientific study because its energies and intensities cannot be weighed and measured? It would seem that it is not to the man who remembers that itself weighs and measures all physical energies and can even construct, by processes which it is itself puzzled to explain, the entities of geometry and number and yet is forced to set them up, it knows not why, as the tests and standards of trustworthy knowledge. The science which has to do with the intellect of man has indeed, like chemistry and physics, its own special subject-matter; but inasmuch as this very subject-matter is the function of knowledge itself, it cannot be studied as a special science and continued without leading to the portal of what we have distinguished from all the special sciences by the name of Philosophy. The same is true of ethics, or the science of the ends and rules of human activity. This science, like physics and chemistry, deals directly with its own limited subject-matter. To this subject-matter the adept must in a certain sense limit himself if he would understand his materials and master his tools; but he cannot completely cover his own department unless he studies man in his relations to his fellow-man, to himself, to the animal creation, to the future life if there be such a life, and to his Creator if he can be known. Let him seek never so earnestly to confine himself to ethics alone, he will find before he is aware that he has entered upon the field of

philosophy, and within this into the division of Christian theism or the division of anti-Christian and possibly also of anti-moral atheism.

6. No special science can possibly fall out with a true philosophy or come in conflict with it. You might as soon conceive that a house should fall out with a solid foundation, or a tree should come into conflict with its well-established roots. The teachings of the two can never clash. If it can be shown that a theistic philosophy, or a philosophy that recognizes a plan of benevolence in the universe, involving responsibility for man and the possibility of immortal life, is the only rational or the most rational explanation of the processes which every special science conducts and the axioms on which it rests, then there is no place for any conflict to arise between any special discoveries which any science can reach and the processes by which they are attained or the faiths which these processes assume. Each has nothing to fear from the other. The two cannot possibly come into collision.

7. In order that such a philosophy may show itself to be true, it must show itself to be broad enough for every science to rest upon—the sciences of spirit, with their peculiar properties and laws, as truly as the sciences of matter, with the properties and laws of each. It must explain every description of phenomena, the moral as well as the rational. It must provide standing-room for all, it may exclude none. It cannot be inconsistent with any.

Mathematics and physics and chemistry and physiology and geology and psychology and ethics and political science, and even theology and religion, must each be recognized. The rights of each must be acknowledged. A philosophy which is subjected to such a test as this, which is constantly liable to criticism and complaint from every party, cannot be charged with hostility to any, because perchance it may assert that belief in spirit, in God, and in immortality is a necessary condition or consequence of its being a philosophy at all. I do not assert that there is no exposure to mistake or error in determining a true philosophy, but these exposures are trivial as long as

it is tried by scientific methods and sought for in a scientific spirit. If it is urged that there are biassing influences in favor of a philosophy that satisfies our higher wants and aspirations, we reply that there are also biassing influences against such a philosophy. If theism attracts some minds on what are called theological grounds, atheism does the same. For atheism is as truly a theology as theism, and now and then seems capable of kindling a zeal that overleaps reason and flames into a fanatical ferocity.

8. On the other hand there is serious danger lest the devotees of a special science should make it the rule for every other, and exalt it into a fundamental philosophy. Some of us remember the fable of a besieged city for whose defence a council of citizens was called, representing the chief occupations of its inhabitants, and how, after each man had set forth the virtues of the material he dealt in, the tanner contended that among all there was nothing *like leather*. This story is exemplified in so grave a matter as the philosophy of the universe. The ultra-materialist cannot believe that anything is real except matter, or that there are any properties or laws which science is bound to respect except the properties and laws of matter.

It is no dishonor to the devotees of the physical sciences to assert that they are especially exposed to this temptation. These sciences are, as they ought to be, largely sciences of observation and experiment, and the facts and theories of which naturally engross the attention and occupy the mind. The *philosophy* on which they rest is a matter of curious interest only to the few. It has no direct interest for those who are occupied with ordinary physical researches. It is not surprising that such men should be ready to explain the phenomena of life and of spirit by the forces and laws with which they are familiar, and be prepared to believe that matter and motion account for the existence of the universe and the occurrence of its phenomena. This is less surprising in consideration of the fact that so great a variety of the most refined material forces, as light and heat and electricity, have to the satisfaction of many been resolved into a single force, and that this force has been ascribed to the capacity

of material particles for varied forms of motion. If this be so, the physicist reasons, let the material be a little more refined and the motions be modified, and matter will put on the phenomena of life. Let the process advance to a higher potency and spirit will appear in its feebler and humbler forms; let it proceed still farther onward and upward and the highest forms of intellectual and moral activity will be manifest. If what was once dead matter can by forces and agencies within itself be sublimated to their finer activities—if that which seems so gross can be finely touched to issues so fine as these—then the universe of matter, self-moved to the noblest manifestations of thought and feeling, has no occasion for any other intelligence than such as sleeps in its own atoms and can be evoked by a happy combination or a swiftly moving stroke. The growth of materialistic evolutionism is similarly accounted for. Let the phenomena of life attract the scientific study of a generation of devoted students. Let the mysterious process of growth from the seed to the plant and the embryo to the perfected animal be the subject of curious yet familiar interest and development becomes the word of the hour, at once exciting the curiosity by its peculiar mystery and then sating it by its frequent recognition till it forgets that it is the greatest of wonders. Let it be discovered that development has a wider range and application than had been supposed, even among living forms and beings; that many so-called species have originated from a simpler form. Let the truth be accepted among zoologists and palæontologists that a law of progress can be traced from simpler to more complex forms of life, from the fossil period down to the present. To any conclusions of this sort philosophy can have no possible objection, provided they are sustained by scientific evidence and are supported by scientific arguments. But when the analogies of the growing seed or embryo are extended to lifeless matter and made the substitute for creative force; when an unthinking tendency to variation coupled with a tendency to conservation equally blind are asserted to be the last formulæ which philosophy needs; when star-dust, rushing from a rarer to a denser medium, is deemed the only, and the ample, explanation of the structure and order of the planetary system, of the production of air and water and earth, of the production of

animal and vegetable life, of the manipulation of sensitive, intellectual, and spiritual activity, of conscience, law, and religion; when, in short, the development of the germ of plant or animal is accepted as the ultimate solution of the evolution of the kosmos and all which it contains, even to the mind of a Humboldt which reflects it by scientific explanation, then we have a right to say in the name of philosophy that the idols of a single private chapel of knowledge shall not be admitted into its sacred fane and lifted up upon the high altar of philosophy. And we do this with reason, forasmuch as the doctrine of evolution, even if it were true, is no fundamental conception on which all the sciences can stand, but supposes many other such conceptions, pre-eminently one, and that is the conception of a plan beginning millions of ages past, most comprehensive of minute detail, infinite in the possibilities which it realizes and rejects, and steadily pressing forward towards its fulfilment—in a word, supposes a creative energy of unexhausted capacity and intelligent wisdom.

In some of these remarks I have anticipated the discussions which lie before us. The remarks may, however, serve to impress the conviction which thinkers of all schools of science are beginning to acknowledge, that the questions that are now agitating the devotees of any department of knowledge can only be answered by asking profounder questions in respect to man's nature, *i.e.*, his capacity to know either matter or mind; in respect to the essence of matter, of life, of sensibility, of science itself; in respect to duty and right and immortality; and again, in respect to the destiny of man as an individual and as a race, in the present and in the future life—most of all in respect to God: whether science compels us to recognize Him or must shut and bar forever the brazen gates which seem to lead into His inner sanctuary, and will forever delude and tantalize the successive generations that stream towards those gates by painted and gilded mockeries that at a distance seem to reveal the mysteries of the highest truth, and on a near approach vanish like the vapor before the sun.

Questions of this sort agitate thinking men to the very depths of their being. They cannot be evaded. They can

XUM

only be answered by cherishing the truly scientific spirit—that spirit which, according to the great expounders of the modern scientific method, is coincident with the spirit which the great Master of Christian truth declared was indispensable to a man who desires to enter into the kingdom of heaven. In prescribing this spirit in searching after truth, the great Master of Christian thinking has given the sufficient rule and inspiration for all philosophical inquiry. Hence when he founded the kingdom of God upon earth he provided a place, and a very large place, in it for a Christian philosophy.

XUM

SOME DIFFICULTIES OF MODERN MATERIALISM.

[A Lecture delivered before the Summer School of Christian Philosophy, 14th July, 1881.]

By Borden P. Bowne,
Professor in Boston University.

ABOUT half a generation ago the leaders of advanced thought appeared in the philosophical and theological wilderness, announcing that the kingdom of science was at hand. Of course the way had to be prepared for the new kingdom by uprooting old views, and the aforesaid leaders were very efficient in this work. Armed with a logic variously described as rigorous, unsparing, relentless, etc., they pushed in all directions as effectually as the beast of Daniel's vision. They pointed out the incoherencies of received views so clearly as to make it plain that no honest man with the least ability could retain them longer. So well was this work done, that the bystander could hardly help thinking that nothing but mental dishonesty would explain the tenacity with which apparently intelligent persons clung to old beliefs. Indeed the prophets of the new era did not fail to hint with great plainness that the old views derived not a little support from unworthy motives. But this necessity of incessantly attacking and exploding old views has been a disadvantage to the new. The advanced thinkers have been so absorbed in attack and negation, as to give little attention to unfolding their own solution of the perennial problems of thought and life. As yet the new philosophy has not attained to proper self-knowledge, tho it can hardly be said to be lacking in self-consciousness; but it only vaguely perceives its own implications. One resulting evil is, that advanced thought does not succeed much better with logic than the unprogressive thought of the past. It is indeed logical enough in dealing with other systems; but it clings to the old theological method of instinct, compromise, and half-way measures in general, in adjusting itself to thought and life. This is doubtless due to its militant history. It cannot be that the brave men who have put to flight so many armies of theological and

XUM

illogical aliens in the name of logic are in the least afraid to follow logic whithersoever it may lead. They have simply had too much on their hands to attend to it. But the lack of this self-knowledge is a defect nevertheless. The chief demand upon advanced thinkers at present is that they leave the theologians for a time, and set their own house in the true order of logic. To help on this good work we propose to discuss the nature and difficulties of modern materialism, especially in its bearing on the problem of knowledge. By materialism we mean any doctrine which makes mind the product or result of organization.

But the simple statement that mind is the product of organization does not give a clear conception of materialism. Indeed the materialists themselves have hardly cleared up their own thought on this point. The difficulty is not merely to know how mind can be a product, but in what sense mind is a product. Of course it is not held that the elements create a substantial mind, but only that mind is the sum of mental states which are produced by organization. But the sense of this production is unclear. For a time the formula among materialists was, that the brain secretes thought as the liver secretes bile. This view regarded thought as a thing, and further overlooked the fact, that the secretory organs either separate from the blood what is already in it or make the products from materials contained in the blood. This view, then, would imply, either that thoughts pre-exist in the blood or that they are made out of blood. In either case, a very sharp eye would enable us to see them. This view of course was speedily abandoned, and the immateriality of thought was insisted upon. Most advanced thinkers would feel insulted if such gross notions were attributed to them; and one of the leaders has stigmatized them as "the materialism of the savage." Unfortunately they have succeeded better in telling what they do not believe than in telling what they do. Sundry nerve-centres are said to have the function of producing consciousness, just as other nerve-centres have other functions; but still the sense of this production is left unclear. As long as thought was viewed as material there was no absurdity in viewing it as a brain-product. The brain produces nothing, but merely modifies existing matter.

If, then, thought be a material combination, it is easy to

understand how it may be produced by the brain. There is no unlikeness between the antecedent and the consequent. The difficulty with this view is that it is nonsense, not that it is unintelligible. But when thought is viewed as immaterial, it is hard to understand the sense in which it is a product of material activities. The difficulty with this view is that it is unintelligible, and it may also be nonsense. The trouble here arises from the laws of energy and continuity. The conservation of energy demands that no energy shall be lost; and as nerves consume energy in performing their functions, thought must represent a certain amount of energy consumed in its production. If physical energy is spent in producing thought as thought, it must lay aside all its distinctive features and disappear in the mental realm. But in that case either physical energy would be lost or mental energy would be as real as physical energy. The physical realm would be in interaction with the mental realm, and thought, feeling, and volition would count in the course of events as well as the physical forces. It would even be possible in that case to view the mental side of matter as basal, and the physical side as appearance. Of course the materialist will not accept this view. For him the physical series is the abiding and independent fact. As such it is controlled only by the laws of force and motion. The thought-series is effect only, and never cause. But in order to make it effect only we must deny that physical energy is ever expended in producing thought as thought. It must be spent only in producing those physical states which have thoughts for their inner face; and these thoughts, as thoughts, must be powerless. They can affect the physical series not as thoughts, but only as having physical states for their outer face. Any other conception would bring us into collision with the conservation of energy; for under this law there can be no effect which is not reciprocally a cause.

These considerations have gradually led the more logical materialists to the following view: The physical series is self-contained and independent. It suffers no loss and no irruption. Both energy and continuity are absolutely conserved. Each physical antecedent is entirely exhausted in its physical consequent; and, conversely, each physical consequent

XUM

is fully explained by its physical antecedent. All physical movements are physically determined. The mental series is not properly caused by the physical series, but attends it. If the latter caused the former in the sense of expending energy upon it, either the continuity of the physical series would be broken, and energy would be lost, or thoughts would be as real as things. But the thought-series cannot be independent of the physical series, for that is contrary to the hypothesis. There is only one course left. We must view the mental series as the subjective shadow which attends the physical series. When, then, the physical series is of a certain kind and intensity, it has a mental side: but the reality, the energy, the ground of movement are entirely in the physical series. Physical energy is never spent in producing thought as thought, but in producing physical combinations which have a thought-face. Conversely thoughts count for nothing as thoughts, but only as represented in the physical series by physical states. Memory, reflection, and reasoning are only the mental side of changes in the brain. Mental movement of every sort is due not to any self-determination of reason, but to the nervous mechanism. A change of ideas means that the corresponding physical states have been displaced by others. This view has been elaborated at greatest length by Mr. Spencer in his "Principles of Psychology." He aims to show how all mental phenomena are but the inner side of molecular motion in the brain, or of what he calls nascent motor excitations. But the view is best expressed in the following quotations from Prof. Huxley's lecture "On the Hypothesis that Animals are Automata:"

"It may be assumed, then, that molecular changes in the brain are the causes of all the states of consciousness in brutes. Is there any evidence that these states of consciousness may, conversely, cause those molecular changes which give rise to muscular motions? I see no such evidence."

"It is quite true that to the best of my judgment the argumentation which applies to brutes holds equally good of men; and, therefore, that all states of consciousness in us as in them are immediately caused by molecular changes of the brain-substance. It seems to me that in men, as in brutes, there is no proof that any state of consciousness is the cause of any change in the motion of the matter of the organism. If these positions are well based, it follows that our mental conditions are simply the symbols in consciousness of the changes which take place automatically in

the organism; and that, to take an extreme illustration, the feeling we call volition is not the cause of a voluntary act, but the symbol of that state of the brain which is the immediate cause of that act."

It is easy to see how the materialist comes to this view. He must maintain the continuity and independence of the physical series. Hence he cannot allow that physical energy ever becomes anything else. Again, he cannot allow that the mental series has any energy or principle of movement in itself without making it as real as the physical series. Hence he is shut up to the view that the mental series is only a powerless attendant upon the physical series. But while it is easy to see how we come to this view, it is doubtful if its implications are fully understood even by the advanced thinkers themselves. If we observe the myriad movements of a great city, we are apt in uncritical moments to fancy that thought and purpose enter into them as originating and controlling. But now we know better. There is no ground for believing that any mental state can affect any physical state. The movements, then, are purely automatic; and tho we may believe that they are accompanied by thought and purpose, the thought is not the source of the movement, but only a sign that the movement is going on. In strictness there is very little ground for admitting the coexistence of thought with these movements; and it is very difficult also to tell for whom thought exists as a sign that nervous movements are going on. We may be tempted to say that the sign exists for the mind; but the mind is the sign. In strictness there are no advanced thinkers, but only advanced thoughts and feelings. The so-called thinker is but the sum of the advanced states. Again, we may suppose an advanced thinker preparing and delivering a lecture in support of the doctrine in question. Even the thinker himself, owing to the contagion of old views, would be likely to fancy that his thought and purpose count for something in the outcome. But this is plainly a mistake. To begin with, there is no advanced thinker; and if there were, he could only be a passive spectator of his mental states. The writing and reading of a lecture is purely a matter of physical movement; and we know at last that no mental state can affect any physical state. The preparation of the lecture may be attended by thought, tho that is doubtful;

XUM

but it certainly takes place without any intervention of thought. The thought, if present, is only the sign to nobody in particular that the nerves are doing the work; and if the nerves remained unchanged, they would do the work just as well if thought were entirely absent. On this point we have not the slightest doubt: and the doctrine enables us to understand many of the homilies from this quarter. It has long been a puzzle to the critical mind how any rational being could produce some things which have appeared among the clumps of advanced thoughts. But now we see that reason has nothing to do with their production; and the wonder rather becomes that the nerves should do so well.

But even yet we have no clear conception of the relation of the thought-series to the thing-series. Taken in earnest the theory in question reduces to pure magic. In physics under the law of conservation and correlation, there is no effect which does not in turn become a cause; and as by hypothesis thought as thought is never causal, it is never properly an effect. If we could look into a living brain, we should see the molecules in movement in various ways. This is the physical side and series. But some of these movements and combinations are said to have a subjective face. This is the mental side and series. This mental side, however, would not appear as such in the physical series. We should see, then, various combinations and movements of molecules. The movements may be conceived as spiral, elliptical, rectilinear, oscillatory, etc. When given groups of molecules are moving in one form, as an ellipse, they have no inner face; but when they are moving in some other form, say a spiral, they are attended by thoughts. No physical energy is drawn off to produce them; they are simply there. The spiral movement confines itself strictly to being a spiral movement, just as the elliptical movement confines itself to being an elliptical movement. Why, then, should the spiral movement be attended by thoughts while the elliptical movement is not? There is no answer except to say that it is the fact. There is no difficulty in understanding the generation of the spiral movement; but whence comes this new series? We get no hint of it by studying the spiral movement. The thought-series as such is simply and

purely magic. There is no ground for it in the physical series; and there is no mental subject to generate it as the result of its interaction with the physical series. Thoughts appear and disappear without any assignable reason whatever. It does not help us to assume a hidden mind-face to matter which is manifested only under certain conditions, say upon occasion of a spiral movement among the molecules; for it is plain that to be manifested at the proper time the mind-face must be acted upon by the physical face. Otherwise the mental manifestation might occur at any time, and in any form whatever. There must be something in the elliptical movement which represses mental manifestation; and there must be something in the spiral movement which elicits it. But this puts the origin of thought back of the spiral movement and in the hidden nature of matter. There is, then, a double movement in matter—a physical and a thought movement. But this leaves it doubtful whether matter as thinking, or matter as moving, is the true reality, or whether there may be something deeper than both. Either alternative is fatal to the assumed self-sufficiency of the physical series. Many materialists are inclined at this point to take refuge in the notion that the reality is deeper than both the physical and the mental series, but in so doing they fall into all the difficulties of Spinozism. The unknown reality, as having physical manifestations, contains no explanation of its mental manifestations. The latter must find their ground not in the physical series, but in the thought-nature of the true reality. But how comes the latter to have two sides? and how come these two sides to be parallel as thought and thing? Thus our monism vanishes into dualism; and thus the question escapes the materialist and disappears in the region of high metaphysics. Of course the materialist will not allow this, but will still insist upon the self-sufficiency of the physical series. In that case all our difficulties come back. We cannot allow the mental series to have any energy in itself, or to be in interaction with the physical series. We must always remember that there is no reason for believing that any mental state can affect any physical state; for the physical series goes along by itself. There is no double movement in matter, for by hypothesis the reality is entirely in the physical series. The thought-series appears as a magical

XUM

and groundless addition to various parts of the thing-series. Thus the same logic which brought us hither takes us farther. It is a break of continuity to assume that the thought-series can determine the thing-series. It is equally a break of continuity to assume that the thing-series can determine the thought-series as such. What, then, is the relation of the two? We cannot call it occasionalism, for occasionalism would imply a cause apart from the thing-series which adjusted the thought-series to it. It is occasionalism in the sense that the physical series does not produce thoughts, but occasions them; but as it occasions them without becoming them or expending energy upon them, the relation between the two series is that of pure magic. The materialist cannot admit the efficiency of thought as thought; hence he is shut up to affirming either the materiality of thought or a magical occasionalism. Either we must allow that certain molecular groupings are not merely attended by thoughts, but are thoughts, or we must take refuge in magic. The first view is intelligible, but nonsensical; the second view is not intelligible, and hence it is difficult to say whether it is nonsense or not. Thus we see that while the materialistic doctrine seems very clear, it is fundamentally unclear not merely in its possibility but primarily in its meaning.

Few materialists would accept this conclusion, owing to the little attention they have bestowed upon the problem. In particular they would repudiate occasionalism, even in its unmagical form, as a moth-eaten relic of metaphysics. But when it comes to telling in what sense thought is caused by matter, or how the impotence and immateriality of thought can be reconciled with the laws of continuity and conservation, they implicitly take refuge in a magical occasionalism. Every physical effect is a new condition of matter; and as thought is not matter in any condition, it is put outside of all physical effects. One distinguished writer upon the new philosophy assures us that no study of the physical series would give us any hint of the thought-series which attends it. The latter is always there when summoned; but it sits apart from the moving matter. This would be quite intelligible if there were a mind outside of the physical series, but it is quite magical on any other theory. When heat and light are "summoned," energy is always spent

in summoning them; but when thought as thought is summoned, it appears without any assignable ground, certainly without any expenditure of energy. One very popular attempt to escape this difficulty deserves mention, for it underlies all materialistic theories at this point. Thought is said to be a phenomenon of matter; and this formula is supposed to remove all difficulty. Phenomena are not caused, but simply appear. This suggestion does seem to help us a little until we remember that a phenomenon implies not only something which appears, but also a subject to which it appears. When, then, the thought-side of matter is said to be phenomenal, the question at once emerges, What is the subject and where the consciousness for which the phenomena exist? For the materialist there is no such subject. Yet so natural is the thought of self that we never divest ourselves of it even when denying it. When the materialist views the brain as a thinking machine, he always tacitly assumes himself as a reading machine which reads off the result. When we are told that nerve-motions have thoughts for their inner face, a self is always supplied for whom the thoughts exist. Materialistic statements tacitly assume back of the organism which conducts the mental processes a looker-on who tells off the processes and interprets their meaning. Thus thought is said to be a sign of nervous processes; but for whom does the sign exist? The outsider could not see the thought, but only the nerve-movements. For whom, then, is the thought a sign? For the thinking self, of course. Thus the self which the materialist labors to destroy, peers complacently through the very arguments which are framed for its destruction. Materialism succeeds in reducing the self to passivity so far as the physical world is concerned; but it remains throughout a critical spectator of the on-going. But this is a grave inconsistency. Materialism allows no self, and hence it cannot make thought phenomenal. The thought-series cannot be an appearance, for there is no one to whom it can appear. It cannot be a sign or symbol in consciousness only, for there is no one to read and interpret the sign, and consciousness itself is nothing apart from the sign. Thinking, then, as such must represent a real process in matter. But this also is contrary to the hypothesis. Matter does not think, but moves. Some of

XUM

these movements are said to have thoughts on the inside, but the moving matter is the only reality. Where, then, and how do the thoughts exist? They do not exist in mind, for the mind is but the sum of the thoughts. Nor do they exist in consciousness, for this is nothing apart from its objects. The conscious thoughts, then, must exist in matter itself. But this, too, is contrary to the hypothesis, for the physical series as such is supposed to be the only reality. Thus the mental series is supposed to be something external to the physical series, and hence external to reality. This is a grand embarrassment. It would seem that the physical series has its inner face not in itself but in consciousness. In itself the physical series is a redistribution of matter and motion, and it becomes more only in consciousness. But consciousness, again, is the inner face and not the place of its existence. Hence matter must have its inner face in itself. It would, too, be highly presumptuous on the part of consciousness to give reality any qualities which it does not have. Thought and consciousness, then, are real processes in matter. Thus we come around to the old possibility that matter as thinking and conscious may be the true reality, and that matter as moving is only an appearance. It is very hard to unravel this puzzle. If matter only moves, whence is thought? If it both moves and thinks, what becomes of the claim that all energy is in the physical series? If matter does not think, and if the mind is nothing, what does think? Perhaps it will be well to leave these problems to the materialists themselves. As yet they have given us no clear statement on these points. It would be a boon if they would state their doctrine so that it neither vanishes into magic nor identifies thought with material movements. We do not care to have the doctrine proved; but it would be well to have it clearly stated.

Thus far it has not been our purpose to dispute, but only to expound. We have not sought to disprove materialism, but only to find what it is. The materialist holds that thought is produced by organization; and it is interesting to know the sense of this production, and especially how the impotence and immateriality of thought can be either maintained or given up on materialistic premises. We pass next to discuss the bear-

XUM

ings of every form of materialism on the problem of knowledge. And first we point out that we reach the thing-series only through the thought-series. We know that there are things, and what they are, only through thought. Hence while the thing-series may be first and fundamental in the order of fact, in the order of knowledge the thought-series is first. A first question, then, would be, What warrant is there for affirming a thing-series at all? If the thought-series be so emaciated and helpless as the materialist teaches, why trust its reports about things in any case? Why may not the thing-series be after all only a phase of the thought-series? From Hume to Spencer, materialistic philosophers have defined the thing-series as a series of vivid states of consciousness; while the ego is a series of faint states of consciousness. But vivid or faint, this definition makes both subject and object states of consciousness, and hence both belong to the thought-series. Here is the place where materialism always tumbles into idealism, whenever it attempts to reason out a theory of perception. It is well known that Spencer at this point, when his theory was about to collapse into nihilism, saved himself by reinstating the ego as a true agent. The ego, from being a series of faint impressions or the inner side of nerve-movements, suddenly becomes a true source of energy; and the warrant for affirming a thing-series apart from the thought-series is found in the fact that our own energy is resisted by an energy not our own. This is excellent doctrine; but it does not agree with the other doctrine that the ego is only a sum of mental states, and that mental states affect no physical states; for it makes our own consciousness of effort and energy the turning point in the debate between idealism and realism. Upon the whole, we advise the materialist not to debate this point, but quietly and colossally to ignore it. It will be hard to get out of the debate either without falling into idealism or without admitting the real agency of the ego. Logic is a good thing, but in such a state of affairs it would be easy to get too much of it.

We pass this point and raise another. All arguments for the efficiency of matter assume that we have a valid knowledge of matter. That X is adequate or inadequate is a proposition which admits of no discussion. The thought-series, then, must

XUM

reproduce the thing-series, and it is of interest to know how this can be. The general notion that the latter determines the former in no way implies that the latter must determine the former so as to correspond to itself. If an organism be able to generate thoughts, it by no means follows that the thoughts must represent external objects. One would expect that the thoughts would represent, if anything, the organic processes of which they are the inner face; whereas they never refer to these, and commonly refer to things entirely apart from the organism. Nervous combinations and movements are said to have ideas for their mental face, and the natural thought would be that those ideas would be ideas of their peculiar nervous correlates. But this is never the case; indeed the current doctrines about those correlates are even now matters of not very cogent inference. This complete silence of the organism as to what is going on in itself, and the report instead of what is taking place in the outer world, are very remarkable facts. Certainly when matter is declared to be a double-faced entity, we expect to find the mental face reflecting that part of the physical face which is over against it; but the mental face never reflects the series which produces it, but other and unconnected series. Thus rays of light fall upon the body and a thought results, but not a thought of nerve-processes nor of vibrating ethers, but of an external luminous object. It is strange indeed, that anything should result, but that the thought should be of an object at many removes of mediated action, is surprising in a far higher degree. The wonder is still greater in our perception of others' thoughts. Here some waves of air fall upon the ear, and at once the nerves produce thoughts with the added assurance that they are the reproduction of a thought-series existing apart from our own. There is the additional wonder in the latter case that some nerves produce thoughts only in response to certain vibrations, and other nerves need different vibrations. The difference between a Frenchman and an Englishman is fundamentally a difference of nerves. We can now understand the problem. If knowledge is to be possible, the mental series must truly reproduce the physical series and all other mental series; but what ground is there for affirming that they must correspond? This particular problem has

not received the attention from materialists which it deserves. In general, they have never considered the problem of knowledge at all, but have taken the crude theories of common-sense for granted. But the problem is a real one and demands a solution. And for the materialist there is no solution except some debased form of the pre-established harmony. He must assume not only that matter can generate thoughts, but that it is shut up by its nature to the generation of thoughts which correspond to the outward fact. He must even assume that bodies are so related to their surroundings as to be under obligation to generate correct thoughts about things in general. We call this a debased form of the pre-established harmony, because it denies the pre-establishment which alone saves the doctrine from imbecility. Many materialists have taken refuge from this admission in agnosticism; but materialism will not unite with that view except as a dogmatic affirmation. The entire proof of materialism rests on the assumption that we have a valid knowledge of matter. The thought-series, then, must correspond to things; but why? The only answer is, that matter is such that in the main it must produce true thoughts; but this is simply to affirm the fact without giving any insight into its grounds. But this theory is far worse than Leibnitz's pre-established harmony. Leibnitz found some reason for the harmony in the fact of its pre-establishment, but the materialist has simply to assert it and leave it unexplained. Moreover his harmony is not such a harmony between thought and thing as between body and thing. As the materialist degrades the Cartesian occasionalism into magic, so he degrades the Leibnitzian pre-established harmony into an opaque and unintelligible fact. This is a rather sorry outcome for a system of reasoned truth. Instead of progress we have a remarkable case of reversion, or atavism, and also a somewhat striking illustration of the law that degradation is as possible as progress.

Still the problem has not been entirely unnoticed. Notably the Spencerian evolutionists have sought to account for the harmony in question by a theory framed from natural selection and heredity. According to this view there is no original need that matter should think rightly; but if any organism should think wrongly, it would soon collide with reality and perish. Right

XUM

thinking, therefore, is necessary to continued existence. Natural selection must tend to pick out the sound thinkers from the unsound; and by heredity their tendencies will be integrated and transmitted. The final result will be that thought will at last be adjusted to things, yet without any reference to an opaque and uncaused harmony.

The ingenuity of this view is wonderful; still more so is the uncritical faith which can receive it. For since thought has no effect on physical processes, it is hard to see what effect for good or evil thought can have. The survival of the organism is a purely physical matter with which, by hypothesis, thought has nothing to do. There seems to be here a trace of the antiquated notion of self-control, according to which our knowledge determines our course. In a system of freedom the theory would have application; but when thought is only the powerless shadow of reality, its misadjustment is insignificant. In this theory the destruction of the organism is not due to a maladjustment of thought, but to a maladjustment of the organism. Those organisms which perish are not those which think wrongly, but those which cannot maintain their equilibrium with the environment. But there is nothing in this which implies that those organisms which are in equilibrium with the environment must produce true thoughts of the environment. The crystal maintains itself against its surroundings by virtue of its physical structure; but it does not follow that, if a crystal should have thoughts, they must reflect the surroundings. But why should the same equilibrium imply more in the organism? Why must organisms which can physically maintain themselves think rightly about their surroundings? This they must do if knowledge is to have any validity; but it is hard to find any reason for it. We are forced either to abandon knowledge, or else to fall back again on a grotesque harmony between organisms and their surroundings, such that when they take to thinking they can but reflect their environment. But this is Leibnitz's theory of pre-established harmony in its most debased form. Leibnitz was not content to affirm the harmony between mind and its objects; he explained it by its pre-establishment. Materialism degrades it to a physical significance and leaves it unaccountable.

XUM

Again, it is very remarkable that the narrow range of the Spencerian principle should have been overlooked. If it were true, it would provide for valid thoughts only as they are related to survival; whereas the bulk of our thoughts have no bearing on survival. A mistake in our theory of double stars or in our solar physics would not be attended with any physical disaster. The true theory and the false theory are equally without significance for survival. And since this is the case with the mass of our alleged knowledge, the action of natural selection can never come into play to separate the true from the false. What warrant, then, have we for trusting the report of thought on these things? The uninitiated may be tempted to think that we reach these things by reasoning; but on this theory, reasoning itself is only a function of the nerves. It is but the subjective side of the nervous mechanism; and there is no assignable reason why the nerves should reason more accurately than they perceive. If reasoning were an independent mental activity, self-poised and self-verifying, the case would be different; but the mind is only the sum of mental phenomena, and these phenomena are called up and shifted by the nervous mechanism. Once more, then, what warrant is there for trusting our nerves? That they should produce thoughts about everything is very remarkable, but that these thoughts should represent the reality is in the highest degree surprising. The mental series which originally was the subjective face of sundry nervous movements turns out to be the inner face of all physical series or movements, with the one amazing exception of the physical series on which it depends. To retain our trust in knowledge we must make once more the assumption of a pre-established harmony in its worst form. Who would have expected to find the ghost of Leibnitz in a somewhat degraded state lurking among the ponderous phrases of the Spencerian philosophy!

Another difficulty with this theory of knowledge is that its appeal to heredity and experience is not clearly justified by the principles of the theory. It is well known that when materialism comes to psychology it always allies itself with empiricism and associationalism. Thus Mr. Spencer, when he had conducted the evolution of the universe up to the borders of the mind, attached the associational psychology to his system, and

XUM

thus mind was brought into line with all below it. He also apparently greatly increased the resources of associationalism by his doctrine of heredity, whereby a race-experience was exchanged for an individual experience. In this way the system gained time for its transformations. This is very clear in appearance, but rather confused in fact. In order to learn from experience, there must be something which learns; whereas on the materialistic theory the learner is the experience itself. We learn from experience by remembering the past and deducing principles for present and future guidance. But this is impossible where there is no rational subject which stands apart from the experience and draws inferences from it. Now according to materialism we do not have ideas, we are the ideas. And these ideas are not the product of some past experience, but are the outcome of the organism as it is. An organism made at first hand from the inorganic would have precisely the same ideas, feelings, recollections, and general insight. The only way, therefore, in which experience can affect our mental life is by modifying the organism; it can directly teach us nothing. Nor is it in any sense our mental experiences which modify the organism; these by hypothesis are powerless. And the mental manifestations of the organism are in no sense learned from experience, but are the expression of what the organism is. We may speak of a gradual development of the organism and a corresponding development of mental manifestation, but we cannot speak of experience in the philosophical sense of the word. The same considerations apply to heredity in a materialistic system. Experience cannot be inherited because no one has it, and there is no one to inherit it. We are the experience, and the experience is the outcome of the organism. The experience from which we are supposed to learn is of course mental experience, and this by hypothesis never reacts on the organism. From another standpoint, also, this alliance between empiricism and materialism appears as impossible. The elements from which the materialist builds everything are subject to fixed laws. In all their inorganic manifestations they manifest not their habits but their inner nature. Chemical affinity and molecular combination in general are not the outcome of experience, but of the nature of the atoms themselves. We should expect,

XUM

then, if the elements should ever rise to vital and mental manifestations, that these also would be fixed expressions of what the elements are; not something acquired and adventitious, but something inherent and essential. Indeed from this standpoint the notions of heredity and experience are grotesquely untenable. The elements have laws, not habits; and they neither have nor inherit experiences. Their combinations, also, must be of the same sort; and if it be absurd to speak of the complex molecule as forming habits and learning new forms of action, it is equally absurd to speak of organic molecules as so doing; for organic molecules are simply complex molecules, and the organism is only a group of complex molecules. It is, then, a grave inconsistency when materialism is joined to empiricism, according to which mental manifestation has no fixed and necessary laws, but is a pure product of experience. According to materialism, there is no need of experience for any depth of insight or even for any amount of memory. All that is needed in order to have a perfect insight into both present and past is that the appropriate organism be produced. Materialism, then, is compatible only with a high form of apriorism; and the laws of mind have as good right to be viewed as essential and inviolable as the laws of gravity and chemical affinity. Indeed materialists and evolutionists in general show a very imperfect appreciation of causation in their theories of life and mind. Beginning with fixed elements, the outcome must be fixed; and the fancy that mind may waver and be this or that contradicts the notion of law which is at the bottom of the system. The laws of mind must be fixed in the nature of matter. This is a somewhat bizarre and unexpected result, but it must be admitted. It is needless to point out that psychological empiricism when logical makes materialism as a reasoned system impossible. The union of the two must be regarded as a kind of philosophical adultery. And so we come around to our previous conclusion, that the materialistic theory of knowledge is that of an opaque harmony between the organism and the surrounding world.

We have already pointed out that natural selection, as a principle of belief, does not escape the admission of an uncaused harmony between the body and its environment; we have next

XUM

to refer to a peculiar difficulty which arises from the principle, if allowed to be valid. It follows directly from the doctrine, that no belief can become wide-spread which is contrary to reality; for maladjusted beliefs must lead to collision with the nature of things and consequent destruction. It further follows that every wide-spread and enduring belief must correspond to the nature of things. Certainly those beliefs which originated in the earliest times and which have maintained themselves ever since must be viewed as having far higher probability than the late opinions of a sect. The great catholic convictions of the race represent the sifting action of the universe from the beginning. They are therefore the only ones which, on the theory, can lay the slightest claim to our acceptance. It is, then, in the highest degree inconsistent when the disciples of this view reject a belief because it is old and reaches back to the infancy of the race; for this is the very characteristic of true beliefs. A belief which has only recently appeared can hardly lay any claim to be considered at all. What then shall we do with such beliefs as the belief in God, freedom, the spirituality and immortality of the soul, and the existence of a moral government in the universe? Of course as materialists we cannot accept them; but how can we as materialists reject them? The same brain which has ground out the truths of materialism has also ground out these other notions. That they are not fatally maladjusted to the nature of things is proved by their continued existence; and by hypothesis they are products of that natural selection whose special business is to sift the true from the false. There is nothing to do but to attempt a distinction between maladjusted thoughts which lead to destruction and others which do not. Our thoughts of God and supersensible things are of the nature of dreams. They lie outside of any possible physical experience; and hence they cannot collide with reality any more than with a ghost. Unfortunately it is not easy to draw this line so as to conserve those physical truths which lie outside of any possible experience, and at the same time put religious and other obnoxious ideas to flight. It is a very grave circumstance that matter should be so given to dream and error. Of course the uninitiated will think that reasoning will serve our purpose; but reasoning itself is a part of the nerve-process.

Throughout the past, natural selection has favored anti-materialistic views; in the future, the same process must eliminate materialism. It is plain that those beliefs which make most of the person and which give one most energy and hope must in the long-run have an advantage over others which are relatively discouraging and depressing. Hence in the end, beliefs which tend to righteousness and cheerfulness must overcome all beliefs which tend to looseness and despair. The former will tend to conserve the physical and moral health both of the person and of society; and the latter will be in alliance with destruction. If it be said that we here forget our previous assumption that a mental state cannot affect a physical state, we reply that that assumption is not our own but the theorist's. We do not assume any responsibility for any of these views; we inquire merely into their implications. And since the theorist has introduced natural selection as a determining principle of belief, we inquire whither it will carry us. That this principle does not agree with the other principle, that the physical series goes along by itself, is not our affair. And even if the two did agree, it would be highly unscientific to hold that a change of opinion will have no effect on action. As opinion, of course, it would be powerless, but as opinions are only the subjective sides of nervous states, it follows that a change of opinion points to a change in the nervous processes, and hence it must lead to change of action. Now as a matter of fact, the belief in God, immortality, and moral government has a great value both for personal and social well-being. It is the great source of courage, hope, cheerfulness, and steadfastness in righteousness. And on the other hand it is undoubted that materialism, atheism, etc., are relatively depressing and demoralizing. The rapid spread of pessimism among the more earnest of the advanced thinkers is sufficient proof of this. Hence, under the operation of natural selection, the former set of beliefs will have a decided advantage over the latter; and in the end they must conquer. That matter can form the conception of freedom, the soul, and God, we know by the fact; hence they are plainly not repugnant to the nature of matter. The direction which its future thinking must take under the influence of natural selection is plain. Matter must come at last to a firm faith in the soul, immortality and God.

XUM

Of course the eager objector, carried away by his nerves, urges that believing them would not make them true, but would leave them cherished delusions. It is odd how hard it is for one to master his own theory. By hypothesis matter is capable of valid thinking; and why should we not trust it when it thinks about God as well as when it thinks about the world? We do not insist that it is equally trustworthy; we only ask for some standard whereby one set of thoughts can be ruled out while another is retained. Of course we are beyond the point where we fancied that reason itself is such a standard; for reasoning itself is part of the nerve-processes. It does not contain any standard of truth in itself, but comes and goes according to the principles of nerve-mechanics.

This raises the further question how the materialist can speak of error at all. We have seen that to save knowledge he must fall back on the notion of a necessary harmony between mental action and its objects. But such a theory makes no provision for error. Like the pre-established harmony of Leibnitz, it is incompatible with the admission of error. The theory implies an exact and consistent report of all mental objects, whereas in fact we have the most confused and conflicting accounts. The question, How is error possible? is of the utmost speculative significance; and yet it has been almost entirely ignored in the history of speculation. If knowledge be determined by law, why is not the outcome necessary? And if reasoning be governed by the inviolable laws of thought, how is mistake possible? In order to put any trust in perception every school of thinkers must allow that the interaction of thought and organism must be fixed, so that a given physical excitation will have a definite and fixed mental reaction. But the results of this reaction, in turn, are under the control of fixed mental law. How, then, is error possible either in perception or in reasoning? But if error be as necessary as truth, what reason is there for distinguishing between them? No system of necessity can answer these questions so as to save knowledge. No system of metaphysical necessity is compatible with either science or philosophy. In every such system all beliefs are effects only and are fully explained by their antecedents. They are not deduced from grounds, but are produced by causes. A rational belief, on the

XUM

other hand, is one which has grounds as well as causes; and to discern its rationality we must have a standard of truth in the mind, and we must be able to apply it to our beliefs, and to accept or reject them accordingly. Freedom is necessary to reasoning. In a system of necessity all beliefs are *de facto* and none are *de jure;* or if this distinction should exist for an observer outside of the circle of necessity, we who are in the circle could never distinguish the *de facto* from the *de jure* in belief. For to do this we must be able to control our thoughts according to some law of truth, and this by hypothesis is impossible. And allowing it to be possible, we are still greatly embarrassed as materialists; for a great many conflicting and contradictory beliefs exist. Matter is engaged in producing a great variety of opinions on many important subjects; and it is interesting to know which are to be accepted. Probably the materialist would urge us to accept his views, and would give us his word of honor for their truth. Unfortunately words of honor have no value in logic, and we need something more. The most natural assumption would be that those views are most likely to be true which matter produces most freely; and hence we might test the truth by taking a vote. But sadly enough, the average brain is not so made as to grind out materialism or atheism. Matter in its thinking has a strong tendency toward theism and spiritual conceptions of things; and it has even devoted much attention in the past to metaphysics. Of course these views are false, but how are we to escape them unless the nerves take a new direction? If the human mind were something which is capable of free reflection and which develops variously according to its circumstances, we might account for much variation by the mental environment; but of course this is not the case. It is indifferent to a molecule where it is; and it ought to be indifferent to any complex of molecules. In particular, it is hard to see how the organism can be affected by its mental atmosphere. Prejudice and superstition might influence minds; but they do not seem adequate to influence material movements. Besides, if they could, they are themselves the outcome of material activity. If there be prejudice, superstition, and stupidity in the world, matter is to blame for it. It is matter that hath made both us and our opinions, and not we ourselves. If, then,

XUM

there could be any distinction between reason and unreason in this system we should be forced to allow that along with a little right thinking matter has done a vast deal of wrong thinking. It has an inherent tendency to irrationality and falsehood. It is the sole source of theologies, superstitions, and anthropomorphisms, as well as the sun-clear truths of advanced science. If we were persons with faculties which could be carelessly used or wilfully misused, these things might be laid to the charge of individual carelessness, or stupidity, or dishonesty; but as we are not such persons, all these things must be charged to matter itself. This conclusion remains if we call matter the unknowable, the mysterious one, or anything else which may strike our fancy. In every system of necessity we have to posit in being, along with reason, a strong tendency to unreason which throws discredit on all knowledge. According to the materialist himself, for one sound opinion matter has produced a myriad unsound and grotesque ones. But even yet we have no ground for distinguishing the rational from the irrational. In the old philosophy the distinction between rational and irrational belief is, that the former rests on grounds which justify it, while the latter is groundless. But the new philosophy cancels this distinction entirely, and reduces all beliefs to effects in us. It recognizes production only, and allows of no deduction. All our beliefs are explained by their causes, and none have any rational advantage over any other. The only distinction is of relative extent; and the only standard possible, unless we yield to pure ipsedixitism, is to take a vote, and view rational beliefs as those which are most wide spread and enduring.

Our nerves being in motion along this line, they next point out that the possibility of error can be reconciled with the validity of knowledge only in the fact of freedom. Error must be the outcome of carelessness and volition, if knowledge is to be saved. If it be a necessary consequence of being, knowledge is overturned. The question of freedom is commonly supposed to have only a moral bearing; and its significance for the theoretical reason is entirely overlooked. The utmost that is generally claimed is that if it be denied, moral distinctions vanish; we insist, in addition, that rationality also vanishes. Discussing the question entirely in the realm of duty has the disadvantage

also that questions of passion and interest are especially prominent in that field; and thus there is great room for talking of the strength of motives and of the necessary victory of the strongest. In this way both the subject and the debaters often become sadly confused; and hence it is of advantage to extend the debate into a different realm. Now the essential nature of freedom is not the power to act without a motive, but the ability to choose an end, or law, and to govern one's activities, mental and executive, accordingly. This government may take the form of guidance or of repression. The being who cannot do this is neither moral nor rational. A rational activity demands just such a power. The aim of reason is to bring the *de facto* order of mental experience into the *de jure* order of thought. The mental mechanism under the laws of association brings us mental states in any and every order just as experience furnishes them. As thus produced they are simple facts, and are all on the same plane of actuality. The distinction of true and false, rational and irrational, does not yet exist. This first emerges when the mind comes to transform the actual order of fact into the ideal order of thought; and to do this the mind must be free. To bring its experience into rational order, the mind must be able to test its thoughts, to compare, to retain or reject them as they agree or disagree with the inner law of reason. The mind must not accept thoughts as they are thrust into it, but must sit regnant over the mental mechanism of association, sifting, testing, and ordering its own course according to the law of reason. The mind makes reason its norm, searches in the chaos of sense for the rational and rejects the irrational; and only thus does it rise to true rationality. It is plain that a mind which could not do this would be totally untrustworthy. Its beliefs would sink down into mere facts and below the distinction of truth and error. And even if there be such a thing as truth, our ability to reach it depends entirely on our power to control the given in thought, to suspend judgment, to eliminate the irrational, and to transform the chaos of experience into the transparent order of reason. This does not mean, of course, that the mind can coerce the conclusion, but that to reach a sound conclusion it must be able to control and coerce its activities. On the materialistic theory, the mental state, or rather

XUM

the physical state, does coerce the conclusion; and thus the conclusion represents no truth of reason, but only the resultant of conflicting nervous movements. It is not properly a conclusion, but an effect of its causes. That these will be the same next time we do not know; and if thought be tolerably clear, a complete scepticism of reason must result. Oddly enough, the determinists generally allow such a self-control in reason. They grant a power of thinking twice and of suspending and postponing both judgment and action. They grant that tho the mind cannot coerce reason, yet sound thinking does not come of itself. The inviolable law of reason may be present in the mind, yet unless the mind accept it and make it the norm of its activity, the outcome is error and confusion. Hence the care and circumspection of the scientist and the true thinker. They give all diligence to have their facts established and their premises unambiguous. In particular, they are on their guard against the misleading influence of association which tends to put on a delusive appearance of rationality. Even the associationalist assumes a power over the associations, and an ability to criticise them according to the law of reason He interrupts the processes of association, tears apart their conjunctions, disputes the beliefs which they are said to have produced, and withholds his assent from various alleged intuitions on the ground of his criticism. But in such activity we have one of the purest examples of freedom; and in such freedom we have an absolute postulate of rationality. In order to reach truth, the mind must have a standard within itself, and it must also be self-controlling. The law of reason itself does not secure obedience. The mind must be able to choose the law and to govern itself accordingly. With this assumption of freedom we can explain error without overturning the trust of the mind in itself. Error is the outcome of a careless or wilful use of our freedom. Our faculties are made for truth, but by neglect or misuse they may lead to error. Without this assumption of freedom, truth and error are alike necessary and alike justified. There is no longer any standard of distinction; and one belief is as good as another as long as it lasts. The belief in the soul is a fact which things have produced in us. The belief in materialism is a fact of the same sort. Neither has any logical advantage over

the other. If it were possible to reason, to examine the grounds of each belief, to compare them with some inner standard of truth, and to accept or reject accordingly, it would be otherwise; but as it is, both are at once logically groundless and necessarily produced. We do not claim that these considerations prove the fact of freedom; but we do claim that whoever will follow them to their consequences will see that freedom and rationality stand or fall together. A common assertion of the advanced thoughts is that freedom would make science impossible. It is well, then, to set up the counter-claim that without freedom there could be neither philosophy nor science.

It is strange how old delusions haunt us. Throughout this paper we have assumed that a power of reasoning is possible, and that there is such a thing in thought as sound logic. Hence we have assumed to judge and criticise as if logic were still in existence. While we have allowed the nerves to be all, we have assumed to remain as a critical spectator of their performances. We have also treated the materialist as if he had power at least over his thinking; and we have urged him to rectify his views, as if that were possible. And all thinkers of every school make the same assumption. The advanced thinker complains of the conservative that he fails to draw the most obvious conclusions; and this failure is even made the ground now and then for righteous indignation at the cowardice or dishonesty thus displayed. On the other hand, the conservative complains of the advanced thinker that he has not the courage of his opinions, and often falls into grievous backsliding from the faith. All alike appeal unto logic, and all alike assume both the power and the duty of being logical. The materialist may have some doubt of others' power to reason, but he has not the slightest doubt concerning his own. But these appeals to logic are all illogical, and show that we are not fairly under the influence of the new views. It has doubtless been a surprise to all critical readers to find the materialist so loud in affirmation and so puzzle-headed in argument, so fierce in his demands for logic and so backward in furnishing it. Bully Bottom in his two moods is inevitably suggested. "I will roar you that it will do any man's heart good to hear me;" but fearing to frighten the ladies, he changes his mind and resolves, "I will roar you as

gently as any sucking dove; I will roar you an 'twere any nightingale." At times the advanced thinkers flirt with instinct and impulse in the old common-sense fashion; and once in a while they even go so far as to blaspheme logic and logical consequences. Especially do they turn a deaf ear to demands for consistency, and practise the old theological eclecticism. One professor, in the very lecture in which he proved that we are in all respects what the viscera and nerves make us, urged us to do the duty which lies next to us, as if an automaton could have duties. Our advanced teachers abound in moral exhortation. Many of their performances in this direction are as edifying as the old manuals of devotion. Assuming logic to be valid and logical reasoning to be possible, we feel insulted by such exhortation. We have a feeling that our teachers are poking fun at us. But all our trouble arises from the fancy that logical reasoning is still possible; and all our difficulties vanish when we abandon this pestilent heresy. Reasoning is only the inner side of a nerve-process. Consistency might be expected of free minds; but who would expect consistency of nerves? From this standpoint, the abiding wonder is not that the nerves reason badly now and then, but that they ever reason well. If, then, a clump of advanced thoughts fall into irrelevant and inconsistent moral exhortation, it only means that the nerves have wrought in that direction. If such a clump show a remarkable backwardness in drawing a conclusion, the reason is that the nerves are set in another way. The amiable commonplace, the mild religiosity, the occasional attacks of fierce morality, which are the chief components of an advanced thinker, are no indications of personal character, but represent only the droll ways of the nervous plexuses and their nascent motor excitations. Matter plays hide-and-seek with us, that is all. If the advanced thinker were a person and were free to think rationally, we should insist on logic; but as this is not the case, the nerves must be left to their own devices. Anything good which they may grind out is so much clear gain; their illogicality and frequent errors must be reckoned to the misery of being.

Looking, then, at the world-system with materialistic eyes, we see a perpetual and necessary kaleidoscopic process. Parts of this process are attended by thoughts partly true but mostly

false. By hypothesis all of those thoughts which collide with materialism are false. In particular, the notions of right and wrong and freedom and all religious beliefs are pure fictions, by hypothesis, of course. Throughout the world-process there is a strong and almost overwhelming tendency to dream and falsehood; and but for a few advanced thoughts, error would have reigned supreme. Sadly enough, also, whether these advanced thoughts shall hold their own depends in no way upon their truth, but upon the nerves. Beliefs too are seen to be changing. This fact in itself is insignificant, but it is important in its implications. Each belief is the inner side of a nervous state; and a change in one points to a change in the other. What direction the nervous states will take in the future is not clear. It is highly improbable that the evolution philosophy is itself the only philosophy which is exempt from the law of evolution. We must expect that sooner or later all things and opinions will pass, the evolution dogma among the rest. The outlook upon practice is equally suggestive. Hitherto action has been under the influence of those nervous states which have God, freedom, and righteousness for their inner face. It is not sure what it will be when they are displaced by opposite nervous states. History and experience are not without their suggestions; and theory points to a reversal of current principles of action. If it were simply a matter of opinion, it would be immaterial; but as it is a matter of profound changes in the nerves, a change of some kind must result. There is no telling what horrors the nerves may have in store. Of course in this language there is an implicit assumption of freedom, but it is in the language only. We expressly disclaim all power to order our thoughts, to criticise, to draw conclusions, or to resign ourselves to the inevitable.

Plainly this result logically cancels all further inquiry. If there were a mind able to grasp the theory and its consequences, it would declare that the mind can be only a passive spectator of the nervous unfolding. But of course there is no spectator, passive or otherwise. The advanced thinker himself vanishes into advanced thoughts. The nerves are all and in all. The preparation of this paper has been attended by some thoughts; but that thought at most was only the sign to

nobody that the nerves were at work. If, then, any advanced nerves should produce a feeling of miff at anything therein recorded, the nerves which produced this paper produce also the hope that the advanced nerves will supplement the miff by producing the soothing conviction that it is all a necessary nerve-process. Finally if any advanced thinker should escape from his nerves so as to become capable of logical reasoning, we request, as a great favor and as a duty to advanced science, that he show where the logic of these conclusions fails. We have learned by heart the various assurances that truth can do no harm. We fear also that this half-heartedness, this dallying with compromise, this sewing of the new cloth to the old garment, prevents us from reaping the fulness of blessing which advanced science has procured for us. Moreover it is bringing advanced science itself into discredit. When an advanced thinker begins to descant on duty, there are sundry advanced actors who say with Gretchen, tho by no means in her spirit, "That's about what the preacher says, only with rather different words." Then follow sundry brutal sneers about a chromo-religion. And the theologians, too, are beginning to take heart. A few years ago they were pretty thoroughly cowed, or at least bullied; but now that the advanced thinkers have been so illogical as to lay stress on duty and religious sentiment, they are bringing out their degrading dogmas with the old assurance. And it must be confessed that Christianity can outdo advanced science on the field of instinct and sentiment. Besides, we who have followed the prophets of the new dispensation out of the theological and illogical Egypt ought not to be left in the desert without manna and without sight of the promised land. Our nerves, however, will not stop without jotting down the remark that they are not able to produce much expectation in this direction, owing, of course, to the illogical ways of nerves in general and their nascent motor excitations. And even this will not satisfy them, but they must add that at present logic is not the strong point of advanced thinkers. They are sentimental, ethical, religious, and highly prejudiced; but they are not logical.

XUM

THE RELIGIOUS ASPECT OF THE AMERICAN SCIENTIFIC ASSOCIATION.

[Extracted from an article in *The Advance* of 15th September, 1881, by Prof. S. H. Trowbridge, of Glasgow, Mo.]

THE discussion of questions purely religious is not the design of this scientific body, and when occasionally a paper containing more or less which points in this direction eludes the scrutiny of the committees appointed to accept such papers as are fit to be presented, it is almost sure to be criticised as transcending the purposes of the Association. Whatever of the religious element, therefore, exists in the membership of this organization must be sought in some of its indirect manifestations.

Perhaps the best direction in which to look for expression of this element is in the Association prayer-meeting held on Sunday afternoon. This had its origin in the meeting at Saratoga, two years ago. Here the attendance was small and the meeting not remarkable for spiritual power. At Boston last year the attendance and spirit of the meeting were both improved. The meeting which has just closed at Cincinnati is represented by several who were present at all, as still an improvement upon the other two. As regards both points of interest this fact is not a little encouraging. Especially so in regard to numbers, for the number of members attending the Association last year was considerably larger than this. The ideas expressed in the Cincinnati meeting collected almost entirely around the topic of the relation of science to religion. All agreed that the relation is one of harmony and co-operation and not of antagonism. The meeting was led by Rev. H. C. Hovey, of Fair Haven,

XUM

Conn., who introduced it with appropriate remarks in which he wisely avoided treading upon controversial grounds, and showed some of the benefits arising from friendly intercourse between the two parties. The next speaker spoke at considerable length on the general views in regard to science and religion, and instanced some texts referring to the works of creation and the maintenance of the heavenly bodies in their positions, which prove conclusively that the Bible contains scientific allusions and statements of facts which could not have been known to men at the time the Scriptures were written. Hence the Bible must be the work of God and not of man. The next who spoke compared favorably the present prayer-meeting with its predecessors, and encouraged us with the increasing development of the religious element in the Association. Another remarked that the chief reason why God is not seen in nature by all students of nature is that he is not looked for in his works, and men see just and only what they want and try to see. If nature is studied *as the work of God* one cannot fail to see God in it all, and it is the duty of friends of Christianity in the Association to declare that whom the materialistic scientists ignorantly worship under the name of nature, matter, force, and law, the Christian scientist knows to be the God who controls the universe. Another said that science should be studied in simplicity and with the teachable spirit of a child.

At the Cincinnati meeting another opportunity was afforded for learning the drift of sentiment of some of its members in the Y. M. C. A. meeting on Sunday night. This was largely attended, principally by citizens, but considerably by members of the Association, and was carried on almost entirely by scientific visitors. Here the central thought was the bearing of the belief in evolution upon religious faith. While a certain kind of evolution was admitted to exist, the general conclusion seemed to be that evolution, in its usual acceptation, was necessarily antagonistic to Christianity. One criticised the assumption that evolution is a settled fact upon which scientific theories can be safely based, whereas in fact it is only an unproved assumption and as yet incapable of proof. Another showed the bearing of certain texts of Scripture upon the question in hand. The only speaker not connected with the Scien-

XUM

tific Association was somewhat bitter in his denunciation of scientific men as subverting the teachings of Scripture and destroyers of the Christian's faith. The next speaker, noting that most of the views expressed led to the conclusion that a belief in evolution was incompatible with Christianity, endeavored to show that this position is not necessarily correct. He held that there were two schools of evolutionists, between which the connecting links were as difficult to trace as between the monkey and man. The one claims that all the processes of nature are due to forces within nature herself, and these, so far as their study of nature is concerned, ignore the agency of God in it. To this extent they are godless, but it does not follow that, outside of their study of nature, they may not believe in God, and reverently worship him. The criticisms of the meeting seem to apply to this class as exclusive representatives of scientific thought, and all belief in evolution is condemned because of the supposed heterodoxy of this one school. The other school, which embraces no inconsiderable part of the scientific world, believe in evolution as the work of God and as his method of creation. The speaker claimed that there are abundant evidences, though not conclusive, that God's plan of creation was by some form of evolution; and that if we are ever forced by facts to accept some mode of creation which we had not foreseen and which is not in harmony with our previous belief and habits of thought, it will be *God's work still.* He claimed that it is unjust, immoral, and unchristian to assert that all believers in evolution are rejecters of God. It was also stated that the Bible and science are mutual helps, supplementary and complementary to each other; and that neither can be understood in all its fulness without illumination from the other. The last speaker, seconding the remarks just made, held that the religious world was too apt to jump at conclusions and to condemn the whole scientific world for beliefs which the critic did not clearly understand, and if understood would be found not necessarily antagonistic to religious belief.

Thus far there has been no means of determining the entire number of professing Christians in the membership of this scientific body, but it is without doubt much larger than many suppose. It was stated at the closing session of the Associa-

XUM

tion that the number of ministers among the members present this year was thirteen. On consultation with various members afterward we concluded that thirty would be much nearer the truth. It is hoped that some way of accurately determining these facts will be devised by the next meeting.

Dr. J. M. Buckley says: "Professor Clifford, beginning as an evangelical, drifting into rationalism, and ending as an agnostic, if not an atheist, died some time since. His widow recently wrote to a London paper that the epitaph inscribed upon his monument, just erected, is this:

> "I was not, and was conceived;
> I *loved*, and did a little work;
> I am not, and grieve not.

"This is all that agnosticism, infidelity, or atheism has to say! And yet the third line shows the weakness and presumption of its author. 'To be, or not to be? that's the question.' How did the one who wrote it know that now Professor Clifford is not, or that if he is, that he grieves not? 'To such base uses [is his philosophy] come at last.' Contrast with Paul's triumph 2 Tim., iv. 6–8: 'I have fought a good fight, I have finished my course, I have kept the faith: henceforth there is laid up for me a crown of righteousness, which the Lord, the righteous Judge, shall give me at that day: and not to me only, but unto all them also that love his appearing.'"

AMERICAN INSTITUTE OF CHRISTIAN PHILOSOPHY.

OFFICERS.

CHARLES F. DEEMS, D D., LL.D., *Pres.*
JOHN BASCOM, D.D., LL.D., *Vice-Pres.*, Wis.
Hon. KEMP P. BATTLE, LL.D., *Vice-Pres.*, N.C.
Rev. Bishop CHAS. E. CHENEY, *Vice-Pres.*, Ill.
Gen. G. W. CUSTIS LEE, *Vice-Pres.*, Va.
JAMES MCCOSH, D.D., LL.D., *Vice-Pres.*, N. J.
Rev. Bishop H. N. MCTYEIRE, *Vice-Pres.*, Tenn.
Rev. AMORY H. BRADFORD, *Secretary.*
WM. O. MCDOWELL, *Treasurer.*

MEMBERS.

Life Members, by payment of $100.

Howard Crosby, D.D., LL.D., New York.
Charles F. Deems, D.D., LL.D., New York.
Rev. Bishop J. F. Hurst, Des Moines, Iowa.
Mr. William O. McDowell, New York, N. Y.
Mr. William T. McDowell, Newark, N. J.
Rev. Bishop Holland N. McTyeire, Nashville, Tenn.

Life Associates, by payment of $50.

Samuel S. Constant, Esq., New York.
Gen. G. W. Custis Lee, Pres. Washington and Lee University, Va.

Members, by payment of $10.

Lyman Abbott, D.D., Cornwall-on-Hudson, N.Y.
Rev. John Bascom, LL.D., Pres. University of Wisconsin.
Hon. Kemp P. Battle, LL.D., Pres. University of North Carolina.
Levi M. Bates, Esq., New York.
C. N. Bovee, Esq., Bloomfield, N. J.
Rev. Amory H. Bradford, A.M., Montclair, N. J.
J. L. Cabell, LL.D., Pres. Nat'nal Board of Health.
Rev. Bishop Charles Edward Cheney, Chicago, Ill.
Charles M. Davis, A.M., Bloomfield, N. J.
Wesley R. Davis, A.M., New York.
Rev. Edward M. Deems, A.M., New York.
Wm. E. Dodge, Jr., Esq., New York.
Gen'l O. O. Howard, LL.D., West Point, N. Y.
W. J. Hutchinson, Esq , New York.
Charles E. Knox, D.D., Bloomfield, N. J.
Joseph J. Little, Esq., New York.
J. H. McIlvaine, D.D., Newark, N. J.
James McCosh, DD., LL.D., Pres. Princeton College, N. J.
Alexander Nicoll, Esq., New York.
Ex. Norton, Esq., New York.
Cornelius Olcott, M.D., Brooklyn, N. Y.
George Patterson, D.D., Rector St. Philip's, Atlanta, Ga.
T. E. F. Randolph, Esq., New York.
Reuben Ross, Esq., New York.
Henry Spellmeyer. DD., Jersey City, N. J.
J. M. Sturtevant, D.D., LL.D., Jacksonville, Ill.
W. A. Scott, D D., LL.D., San Francisco, Cal.
Marshall B. Smith, D.D., Passaic, N. J.
W. J. R. Taylor, D.D., Newark, N. J.
Hon. John W. Taylor, Newark, N. J.
Dr. E. Todd, New York.
Adam Wallace, D.D., Ocean Grove, N. J.
Miss Jennie E. Waterstone, Greenwood Lake, N.Y.

Associate Members.

Henry C. Alexander, D.D., Prince Edward County, Va.
Mrs. Lucy B. Armistead, University of Virginia.
Mrs. Cornelia Ahrens, New York.
Henry M. Bacon, D.D., Toledo, Ohio.
Alexander Brandon, Esq., New York.
William W. Blauvelt, A.M., D.D., Lamington, N. J.
A. H. Clapp, D.D., New York.
D. Edgar Close, Esq., New York.
Hon. Joseph J. Davis, Louisburg, N. C.
Rev. George A. Gates, A.B., Montclair, N. J.
James F. Harrison, M.D., Prof. University of Va.
Mrs. W. H. Hackney, Chugwater, Wyoming Ter.
Hon. Abram S. Hewitt, New York.
Hon. Thomas J. Jarvis, Governor of the State of North Carolina.
Rev. N. W. Lane, M.D., Washington Territory.
Turner M. Jones, A.M., D.D., Pres. Greensboro College, N. C.
Mrs. Dr. A. W. McDowell, Pluckamin, N. J.
John McHarg, Esq., New York.
Gen. Edward J. Mallett, New York.
A. W. Mangum, D.D., Prof. University of North Carolina.
Rev. I. W. Mendenhall, PH.D., Norwalk, O.
G. N. Merryweather, Esq., Cincinnati, Ohio.
Alexander Means, D.D., LL.D., Prof. Oxford, Ga.
Rev. D. Murray, M.D., Memphis, Tenn.
Rev. W. B. Palmore, Jefferson City, Mo.
Wendell Prime, D.D., Editor *New York Observer.*
Harrington Putnam, LL.B., New York.
S. S. Sargeant, Esq., President Board of Trade, Newark, N. J.
Louis Stoiber, Esq., New York.
Hon. Walter L. Steele, A.M., Rockingham, N. C.
Richard S. Storrs, D.D., LL.D., Brooklyn.
Rev. George E. Strobridge, New York.
Addison K. Strong, D.D., Hoboken, N. J.
Miss Cecile Sturtevant, New York.
Rev. Graham Taylor, Hartford, Conn.
Van Campen Taylor, Esq., Newark, N. J.
Chas. S. Venable, LL.D., Prof. University of Va.
Rev. Wilbur F. Watkins, D.D., Rector Church of Holy Trinity, New York.
Edward T. Waterstone, Esq., Greenwood Lake, N. Y.

XUM